NJIT Research Newsletter

Issue: ORN-2016-036

NJIT Research Newsletter includes recent awards, and announcements of research related seminars, webinars, national and federal research news related to research funding, and ***Grant Opportunity Alerts***. The Newsletter is posted on the NJIT Research Website http://www.njit.edu/research/

STREAMLYNE Proposal Submission and Grant Management System Portal is NOW LIVE

Streamlyne is an efficient online proposal submission system for faster review and online approval. The primary objective of the implementation of Streamlyne at NJIT is to remove the paper processing related to Research Administration Proposal, Awards, and Compliance. Major benefits of adopting Streamlyne include online approvals and monitoring, information about submission and workflow, preparation and review of the summary of the budget, and monitoring and management of proposals. Later, Streamlyne software system will be extended to manage regulatory compliance, grant/contract awards, grant expenses through an interface with Banner financial system and online invoicing and billing. These developments will lead to an integrated ***research administration information system*** for monitoring and management of all research related functions and services from proposal submission to grant/contract accounting and closing activities.

Training sessions have been conducted and are continued for faculty and staff through the Office of Research with Directors of Research and Project Managers to colleges. The Office of Research website http://www5.njit.edu/research/streamlyne/ provides the instruction manual and presentations on using Streamlyne portal. For training and questions related to the use of Streamlyne portal for proposal submission, please contact the college/school representative and Research/IT staff:

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NJIT Panel Discussion Event
NSF Faculty Early Career Development Program (CAREER) Award
October 10, 2016; 2.00 PM – 3.30 PM
112 Eberhardt Hall

Faculty Panel
Tara Alvarez, Professor, Biomedical Engineering
Andrei Sirenko, Professor, Physics
Alexei Khalizov, Assistant Professor, Chemistry and Environmental Sciences
Casey Diekman, Assistant Professor, Mathematical Sciences
Moderator: Atam Dhawan, Vice Provost for Research

Scope: The NSF Faculty CAREER proposal submission guidelines will be presented with best practices. All panelists, past and current winners of NSF Faculty CAREER Award will share their experiences on preparation and submission of NSF CAREER proposal. All eligible faculty members are invited to participate in the panel discussion and ask questions about successful proposal submission to panelists.

***NSF Faculty CAREER Award*:** The Faculty Early Career Development (CAREER) Program is a Foundation-wide activity that offers the National Science Foundation's most prestigious awards in support of junior faculty who exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research within the context of the mission of their organizations. Such activities should build a firm foundation for a lifetime of leadership in integrating education and research. NSF encourages submission of CAREER proposals from junior faculty members at all CAREER-eligible organizations and especially encourages women, members of underrepresented minority groups, and persons with disabilities to apply.

Grant Opportunity Alerts

Keywords and Areas Included in the Grant Opportunity Alert Section Below

NJIT: Undergraduate Research and Innovation (URI) Student Seed Grants
NSF MRI and NRT Internal Competitions
NSF: Spectrum Efficiency, Energy Efficiency, and Security (SpecEES): Enabling Spectrum for All; Transdisciplinary Research in Principles of Data Science Phase I (TRIPODS); Plant Genome Research Program (PGRP); Designing Materials to Revolutionize and Engineer our Future (DMREF); Emerging Frontiers In Research And Innovation 2017 (EFRI-2017); Smart and Connected Communities (S&CC)
NIH: NIH-CASIS Coordinated Microphysiological Systems Program for Translational Research in Space (UG3/UH3); BRAIN Initiative: New Technologies and Novel Approaches for Large-Scale Recording and Modulation in the Nervous System (U01); BRAIN Initiative: Integration and Analysis of BRAIN Initiative Data (R24); BRAIN Initiative: New Concepts and Early-Stage Research for Large-Scale Recording and Modulation in the Nervous System (R21);
Department of Defense/US Army/DARPA/ONR: Young Faculty Award (YFA); Long Range Broad Agency Announcement (BAA) for Navy and Marine Corps Science and Technology
Department of Energy: Sensor and Modeling Approaches for Enhanced Observability and Controllability of Power Systems with Distributed Energy Resources (DERs)
NASA: ROSES 2016: Interdisciplinary Science for Eclipse 2017
Microsoft: Azure for Research Award: Internet of Things; Azure for Research Award: Data Science

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Recent Research Grant and Contract Awards

Congratulations to faculty and staff on receiving research grant and contract awards!

PI: Marek Rusinkiewicz (PI)
Department: Ying Wu College of Computing
Grant/Contract Project Title: Networked Systems
Funding Agency: North C Technologies, Inc.
Duration: 02/15/16-11/05/16

PI: Dantong Yu (PI)
Department: School of Management
Grant/Contract Project Title: High Performance Data Sharing and Analysis Framework for BNL Material Sciences of CFN and NSLS-II
Funding Agency: USDOE
Duration: 09/20/16-09/30/18

PI: Collette Santasieri (PI), Sean Vroom (Co-PI), Elizabeth Limbrick (Co-Pi)
Department: NJIT R&D
Grant/Contract Project Title: NJIT Technical Assistance to Brownfields Communities - USEPA Regions 1, 3, and 4
Funding Agency: US EPA
Duration: 07/01/16-06/31/21

PI: Michel Boufadel (PI)
Department: Natural Resources Protection Development Center
Grant/Contract Project Title: Workshop for Shenzhen Taxation Bureau
Funding Agency: US China Business Training Center
Duration: 09/01/16-02/28/17

PI: Wlliam Marshall (PI)
Department: NJIT R&D
Grant/Contract Project Title: Task 13 Mod 3 Development, Integration, testing, and Training (DITT) of Systems and Process for Systems & Facilities Optimization
Funding Agency: US Army - Picatinny
Duration: 09/27/16-09/28/17

PI: Wlliam Marshall (PI), Costos Gogos (Co-PI), Laurent Simon (Co-PI)
Department: NJIT R&D, Chemical, Biological and Pharmaceutical Engineering
Grant/Contract Project Title: Task 13 Mod 5 Development, Integration, testing, and Training (DITT) of Systems and Process for Systems & Facilities Optimization
Funding Agency: US Army - Picatinny
Duration: 09/28/16-09/28/17

PI: Bryan Pfister (PI), Namas Chandra (Co-PI)
Department: Biomedical Engineering
Grant/Contract Project Title: A therapeutic approach to reduce angiotensin II induced neurovascular complications in Traumatic Brain Injury
Funding Agency: NIH
Duration: 07/01/16-06/30/18

In the News…

(National and Federal News Related to Research Funding and Grant Opportunities)

NSF: The NSF's Engineering Research Centers (ERCs), university led consortia, have been in place since 1984 and 67 such centers have thus far been funded. The program has been restructured several times as the emphasis has shifted from commercial design, to manufacturing efficiency, and now to the globally competitive environment for innovation. The overall intent is to evolve university engineering education towards real world problems and a direct engagement with industry and foreign collaborators/competitors. The ERCs are expected to include not only university partners, but also provide linkages to industry and to underserved populations of students.

In response to a request from the NSF, National Academy of Engineering and the National Materials and Manufacturing Board of the National Academies of Sciences, Engineering, and Medicine have undertaken a study to articulate a vision for the future of the ERC program, examine future drivers of innovation, and examine the most promising models and approaches for multidisciplinary engineering research. The report (https://www.nap.edu/login.php?record_id=23645) of a special symposium held in April in Washington has now been released.

The report contains a number of common themes and findings that may form the basis for future ERC competitions. Among these: despite logistical difficulties, the program should promote an exchange of students and faculty between the U.S. centers and foreign countries; centers should consider a two-way movement of personnel and data between universities and industry partners; open access to all intellectual property should be considered rather than monetizing intellectual property; and, centers should re-orient engineering schools to focus on undergraduate and master's degrees rather than Ph.Ds

NIH: NASA after completing the Space Station in 2011 selected the Center for the Advancement of Science in Space (CASIS) as the managing entity. NIH and CASIS have jointly released a solicitation for Coordinated Microphysiological Systems Program for Translational Research in Space. The objective of the effort is to exploit "tissue-on-chip" technology to predict drug toxicities and efficacies. A high percentage of laboratory and animal tests fail to predict side effects or ineffectiveness of a treatment in humans. Tissue chip devices are now being recognized as accurate models of the structure and function of human organs, such as the lung, liver and heart.

The Space Station offers the ability to conduct biomedical research in space using tissue chip technology to study the effects of microgravity and radiation exposure on many of the human body's systems. Experience to date has shown that accelerated aging takes place in space due to muscle wasting, osteoporosis, reduced cardiopulmonary function, and altered immune response. Understanding mechanisms at a molecular level that are associated with these conditions on the Space Station may advance pharmaceutical development and augment Earth-based studies in basic and human biology.

Read More: Chips in Space Blog on the CASIS website http://www.iss-casis.org/About/AboutCASIS.aspx

Dear Colleague Letter: Seeking Community Input for Topic Ideas for Emerging Frontiers in Research and Innovation (EFRI): The purpose of this Dear Colleague Letter (DCL) is to invite the research community to submit suggestions for Topic Ideas to be considered for the FY 2018 Emerging Frontiers in Research and Innovation (EFRI) Program Solicitation. Suggestions for EFRI Topic Ideas are currently solicited and vetted every two years. Selected Topic(s) become the focus of research supported by the EFRI Program. Solicitations are announced annually for research proposals that fall under the specified Topic area(s). This DCL is not a request for submission of a single research proposal idea; rather, it is designed to solicit submission of emerging topic areas of potentially transformative research and innovation. You may submit your candidate topic idea along with a 500-word description at: https://www.surveymonkey.com/r/efritopicideas_FY2018.

The EFRI Program aims to focus the engineering community on important emerging areas in a timely manner. EFRI evaluates, recommends, and funds interdisciplinary initiatives at the emerging frontiers of engineering research and innovation. These transformative opportunities may lead to: new research directions; new industries or capabilities that result in a leadership position for the country; and/or significant progress on a recognized national or societal need, or grand challenge. The EFRI Program is the signature activity of the Office of Emerging Frontiers and Multidisciplinary Activities (EFMA) in the Directorate for Engineering The deadline for topic idea submission is: **October 31, 2016**

Webinar and Events

Event: The Latest Advances in AFM for Nanotechnology (NJIT)
When: October 6, 2016 10.00 AM – 2.00 PM
Where:

- Seminar Venue : Tiernan Hall, Room 373 — New Jersey Institute of Technology, Newark, NJ
- Demo Venue : York Center, Room 200 — New Jersey Institute of Technology, Newark, NJ

Website: http://www.parkafm.com/index.php/events/workshops/the-latest-advances-in-afm-for-nanotechnology-njit
Brief Description: In proud partnership with the New Jersey Institute of Technology, Park Systems is proud to announce a free workshop and live demo to take place on October 6, 2016 at Tiernan Hall and the Otto H. York Center for Environmental Engineering and Science. The workshop will cover topics such as AFM automatizing software with Self-Optimizing Scan Control and Scanning Ion Conductance Microscopy (SICM) technology, both from Park Systems. In the subsequent live demo, Park Systems will also unveil the functionality of the Park NX10 SICM System—a tool designed to enable innovative studies in electrochemistry. The entire event is open to all interested parties and includes lunch.
Speaker: Dr. Sang-il Park, Founder & CEO of Park Systems, will be a featured presenter at the event. His talk will cover continuous innovations at Park Systems including the revolutionary Park SmartScan software, a pioneering AFM intelligence that produces high quality images with only a single click.
Register at: http://www.parkafm.com/index.php/events/workshops/the-latest-advances-in-afm-for-nanotechnology-njit/individual-registration

Event: NSF I-Corps Webinar
When:
October 4, 2016 2:00 PM - 4:00 PM
November 1, 2016 2:00 PM - 4:00 PM
Website: https://www.nsf.gov/events/event_summ.jsp?cntn_id=189701&org=NSF
Brief Description: Curious about the NSF I-Corps program? Join this monthly introductory webinar to learn more about I-Corps Teams and how they contribute to the innovation ecosystem. During the webinar, I-Corps program directors will answer questions about I-Corps and provide updated information about I-Corps contacts, the curriculum, important dates and other aspects of I-Corps. The I-Corps curriculum provides real-world, hands-on, immersive learning about what it takes to successfully transfer knowledge into products and processes that benefit society. The webinar will be held the **first Tuesday of every month at 2:00 p.m., eastern time.**

To join the webinar:

1. Access the audio portion of the webinar by phone by calling (800) 857-5210 (for callers inside the U.S.) OR (210) 234-7080 (for callers outside the U.S.). The participant passcode is 3192939#
2. Access the visual portion of the webinar (WebEx meeting number 746 732 125):
   - Go to https://nsf.webex.com/nsf/j.php?MTID=m37c931eeb5d7a1c32e62c41975c03a2b
     - Note: Firefox is recommended for Mac users.
     - If requested, enter your name and email address.
     - If a password is required, enter the meeting password: I_C0rp5!
     - Click "Join".
   - You may download the slides in advance--download the slides (PDF, 1.6 MB).

For assistance joining the meeting, go to https://nsf.webex.com/nsf/mc and click "Support" on the left navigation bar.
Note for first-time users: To check whether you have the appropriate players installed for UCF (Universal Communications Format) rich media files, go to https://nsf.webex.com/nsf/systemdiagnosis.php.

Event: 2016 NRT (NSF Research Traineeship) Program Information Webinar
When: November 9, 2015 1:00 AM to December 9, 2016 11:45 PM
Website: http://www.nsf.gov/events/event_summ.jsp?cntn_id=134466&org=NSF
Brief Description: The NSF Research Traineeship program (NRT) prerecorded informational videos to provide an overview of the NRT program and describe the key similarities and differences of the two tracks. The aim of these webinars was to give potential principal investigators information on program announcement 16-503 by emphasizing several key features and requirements of each track.

Event: IEEE Webinar: Simulation of RF Interference in Electronics
When: October 13, 2016 5.00 PM – 7.00 PM
Website: https://www.cst.com/events/webinars/2016-10-13-rfinterference?sc_camp=A0CCD3BCA65C448B975B5EE6EBB8D41A&utm_source=ieee&utm_medium=email&utm_content=rfinterference&utm_campaign=2016series
Brief Description: Connected electronic devices like tablets, laptops, smartphones and the diverse ecosystem of IOT products typically implement multiple RF systems. For example, a smartphone nowadays will offer connectivity for WiFi at 2.4 and 5 GHz, Bluetooth, GPS, GSM, NFC and multiple LTE Bands that need to coexist on a platform with a small form factor. Furthermore, the current generation of data buses like USB 3.0 and DDR4 run at high clock speeds with harmonics spreading well into the RF frequencies. This poses a significant challenge to the designers of such devices as the tight integration can lead to interference between these systems. Such RF interference results in performance degradation of these systems and is not acceptable. In the first part of this webinar, we will demonstrate how a full wave 3D simulation can be used to analyze the coupling between different RF systems, antennas and digital signal lines. The analysis will be performed on a model of a modern, realistic mobile phone with a high complexity. The coupling data will then be used to estimate the possible RF interference using a completely new product: The CST interference tool. In this new system-level tool, RF systems can be defined to analyze inter-system coupling. The analysis delivers the possible occurrence of RF interference at a glance. The interference tool is fully integrated into the CST STUDIO SUITE, making it easy to run different scenarios and test mitigation strategies after the detection of possible interference.
Speaker: Andreas Barchanski received an MSc in physics in 2003 and a PhD in numerical EM in 2007 from the Technical University Darmstadt. He has joined CST's HQ in Darmstadt in 2007 as an application engineer. Since 2012 he is Market Development Manager for EMC. Besides EMC, his main interest lies in simulation of various electronic systems ranging from high speed digital to power electronics. He has authored over 50 scientific papers, journal articles and presentations on numerical EM and its application.

Grant Opportunities

Undergraduate Research

Grant Program: Undergraduate Research and Innovation (URI) Student Seed Grants
Phase-1 URI Student Seed Grants
Phase-2 URI Student Seed Grants
Funding: NJIT Internal and External Grants
Website: http://centers.njit.edu/uri/programs/index.php
Description: NJIT 2020 Vision strategic plan emphasizes providing undergraduate students an outstanding education with opportunities to have research and innovation experience as part of their NJIT learning enabling them to succeed and assume leadership roles in our society.

The Undergraduate Research and Innovation (URI) program has evolved as a significant part of the education and research experience at NJIT. The URI website http://centers.njit.edu/uri/ summarizes undergraduate research and innovation opportunities and provides information about resources and competitions. The proposal can be submitted for Track-1 Technology/Product Development and Innovation, or Track-2 Application based Research.

We are pleased to announce the Undergraduate Research and Innovation Student Grant (URISG) program to provide students Phase-1 Student Seed Grants of $500 per project to pursue preliminary research or demonstrate an initial proof-of-concept/prototypes. URI Phase-2 Student Seed Grants provides up to $3,000 per project to pursue research further or develop a complete prototype. Funds can only be used to order project supplies and prototyping through the Office of Undergraduate Research and Innovation. Phase-2 proposals may be submitted by former Phase-1 Student Seed Grant winners who have completed Phase-1 work, as well as new students who have a research or product idea that has shown the preliminary proof of concept, market assessment or application-based research to establish the need, significance and basic approach. The student may prepare URI Student Phase-1 or Phase-2 Seed Grant proposals following the template with format and guidelines on the URI website http://centers.njit.edu/uri/programs/index.php
Awards: Expected number of awards: 15-20
Up to $500 for Phse-1 Student Seed Grants
Up to $3,000 for Phase-2 Student Seed Grants
Deadline: All proposals should be submitted by **October 14, 2016** following the URI Phase-1 or Phase-2 Student Project Grant Proposal Format Guidelines posted on the URI website http://centers.njit.edu/uri/programs/index.php. Students working with a faculty member may submit URI Student Seed Grant proposals in the required format to Ms. Angela Retino at aretino@njit.edu. All proposals will be reviewed to select up to 15 finalist proposals for presentation to the External Advisory Board in the URI Workshop to be held on October 20, 2016 at the Campus Center Ballroom A from 2.00 PM to 5.00 PM.
Contact Information: Any questions about the program or Information Session should be directed to Ms. Angela Retino, URI Program Administrator, at aretino@njit.edu.

Internal Competition: National Science Foundation

NSF Limited Submission and Internal Competition Through College/School Deans:

Grant Program: NSF Major Research Instrumentation Program: (MRI)
Agency: National Science Foundation NSF 15-504

RFP Website: http://www.nsf.gov/pubs/2015/nsf15504/nsf15504.htm
Brief Description: The Major Research Instrumentation Program (MRI) serves to increase access to shared scientific and engineering instruments for research and research training in our Nation's institutions of higher education, not-for-profit museums, science centers and scientific/engineering research organizations. The program provides organizations with opportunities to acquire major instrumentation that supports the research and research training goals of the organization and that may be used by other researchers regionally or nationally.

Each MRI proposal may request support for the acquisition (Track 1) or development (Track 2) of a single research instrument for shared inter- and/or intra-organizational use. Development efforts that leverage the strengths of private sector partners to build instrument development capacity at MRI submission-eligible organizations are encouraged.

The MRI program assists with the acquisition or development of a shared research instrument that is, in general, too costly and/or not appropriate for support through other NSF programs. The program does not fund research projects or provide ongoing support for operating or maintaining facilities or centers.

The instrument acquired or developed is expected to be operational for regular research use by the end of the award period. For the purposes of the MRI program, a proposal must be for *either* acquisition (Track 1) *or* development (Track 2) of a single, well-integrated instrument. The MRI program does not support the acquisition or development of a suite of instruments to outfit research laboratories or facilities, or that can be used to conduct independent research activities simultaneously.

Instrument acquisition or development proposals that request funds from NSF in the range $100,000-$4 million may be accepted from any MRI-eligible organization. Proposals that request funds from NSF less than $100,000 may also be accepted from any MRI-eligible organization for the disciplines of mathematics or social, behavioral and economic sciences and from non-Ph.D.-granting institutions of higher education for all NSF-supported disciplines.

Cost-sharing of precisely 30% of the total project cost is required for Ph.D.-granting institutions of higher education and for non-degree-granting organizations. Non-Ph.D.-granting institutions of higher education are exempt from cost-sharing and cannot include it. National Science Board policy is that voluntary committed cost sharing is prohibited.

Limited Number of Submission: Three (3) as described below. (Expected from the previous solicitation NSF 15-504)

If three proposals are submitted, at least one of the proposals must be for instrument development (i.e., no more than two proposals may be for instrument acquisition).

Awards Range: $100,000-$4 million

Letter of Intent: Not Required

Submission Deadline: January 11, 2017

Internal Competition Deadline to College Dean's Office: November 1, 2016: Please submit up to 5 pages pre-proposal white paper to your respective Dean by November 1, 2016 in the following format. College level reviews will be conducted by Deans to forward recommendations for up to 2 proposals to the Office of Research and Development by November 7, 2016. The final selection will be announced by November 14. The following format for the pre-proposal is suggested which is consistent with actual proposal guidelines and review criterion:

1. Cover Sheet (not counted in the page limit):
    a. Title of the project proposal
    b. Track Type: I or II
    c. PI name and affiliation and contact information

d. Co-PIs name and affiliation
e. Additional users or any consortium information, if applicable
f. Date submitted to College Dean

2. Project Summary
   Each proposal must contain a summary of the proposed project not more than one page in length. The Project Summary consists of an overview, a statement on the intellectual merit of the proposed activity, and a statement on the broader impacts of the proposed activity.
3. Proposal Description covering the subsections (a)-(e) as posted on the previous RFP on http://www.nsf.gov/pubs/2015/nsf15504/nsf15504.htm with the section:
   (a) Information About the Proposal/Instrument
   (b) Research Activities to be Enabled
   (c) Description of the Research Instrumentation and Needs
   (d) Impact on Research and Training Infrastructure
   (e) Management Plan

   For Instrument Development Proposals (Track-II)

   The section (a) to (e) should be organized to address the following (as described in the RFP):
   (a) Describe the design, construction and commissioning phases of the project, including the work breakdown structure of the project activities (i.e., activities broken into tasks). Include a description of parts and materials, the estimated deliverables, associated timelines and the anticipated cost of each activity.
   (b) Describe the technical expertise that is needed, and that will be available, to execute each activity. Describe the organization of the project staff and methods of assessing performance. For each member of the team, include a description of the responsibilities and explain why a given position is necessary for the completion of the design and construction of the new instrument.
   (c) Assess the risks associated with each activity and describe potential methods for mitigating the risks, and for re-analyzing and modifying the project plan to keep it within scope, schedule and budget.
   (d) Include plans for making the instrument design readily available to other researchers, for example by means of publications, by transferring the technology to other U.S. academic, industrial, or government laboratories, and/or by commercializing the instrument.
   (e) Include plans for the long-term operations and maintenance of the instrument, including procedures for allocating time on the instrument if appropriate. Describe plans for attracting and supporting new users and information on anticipated usage and downtime if appropriate. Inclusion of a letter documenting the performing organization's commitment to operations and maintenance is required as a supplemental document.
4. Preliminary Budget and Budget Justification; and Required Cost-Sharing
5. Brief biographical sketch of PI with a brief description of current and previous accomplishments.

For pre-proposal review, the NSF MRI proposal review criterion may be used to help faculty receive some feedback on their proposals that may be helpful for their final or future proposal submissions. The merit review criterion as posted on the RFP is:

- **Intellectual Merit:** The Intellectual Merit criterion encompasses the potential to advance knowledge; and
- **Broader Impacts:** The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes

Instrument Acquisition Proposals.

The extent of shared use of the instrumentation for research and/or research training. Whether the management plan includes sufficient infrastructure and technical expertise to allow effective usage of the instrument; and provides the organization's commitments for operations and maintenance.

Whether the request for operations and maintenance is justified and reasonable in magnitude. If direct support for student involvement in operations and maintenance is requested, reviewers will be asked to evaluate the involvement in terms of both instrument needs and training the next generation of instrumentalists.

Plans for using the new or enhanced research capability in research and research training.

For instrument acquisition proposals of $1 million or above, proposals should address the potential impact of the instrument on the research community of interest and at the regional or national level when appropriate.

Instrument Development Proposals:

The appropriateness of submission as a development (Track 2) proposal.

The adequacy of the management plan. Does the plan have a realistic, detailed schedule? Are mechanisms in place to deal with potential risks?

The availability of appropriate technical expertise to design and construct the instrument. If direct support for student involvement in development efforts is requested, reviewers will be asked to evaluate the involvement in terms of both project needs and training the next generation of instrumentalists.

The appropriateness of the cost of the new technology.

The need for development of a new instrument. Will the proposed instrument enable enhanced performance over existing instruments, or new types of measurement or information gathering? Is there a strong need for the new instrument in the larger user community?

Grant Program: National Science Foundation Research Traineeship (NRT) Program
Agency: National Science Foundation NSF 16-503
RFP Website: http://www.nsf.gov/pubs/2016/nsf16503/nsf16503.htm
Brief Description: The NSF Research Traineeship (NRT) program is designed to encourage the development and implementation of bold, new, and potentially transformative models for STEM graduate education training. The NRT program seeks proposals that ensure that graduate students in research-based master's and doctoral degree programs develop the skills, knowledge, and competencies needed to pursue a range of STEM careers. The NRT program includes **two tracks**: the **Traineeship Track** and the **Innovations in Graduate Education (IGE) Track**. For More information, please see the previous NJIT Research Newsletter **Issue: ORN-2016-032** or **Issue: ORN-2016-033.**
NJIT Internal Competition for Selection of Proposals
Internal Competition Deadline: Submit an internal Letter of Intent following the NSF LOI instructions (copied below) to your college/school dean by October 7, 2016.

Dean's recommendations with the internal Letter of Intents (not more than 2 for the Traineeship Track and 2 for the Innovation in Graduation Track) should be submitted to the

Office of Research for Institutional Reviews and selection by October 17, 2016. PIs and deans will be notified for selected LOIs by October 24.

National Science Foundation

Grant Program: Spectrum Efficiency, Energy Efficiency, and Security (SpecEES): Enabling Spectrum for All
Agency: National Science Foundation NSF 16-616
RFP Website: https://www.nsf.gov/pubs/2016/nsf16616/nsf16616.htm
Brief Description: The National Science Foundation's Directorates for Engineering (ENG) and Computer and Information Science and Engineering (CISE) are coordinating efforts to identify bold new concepts to significantly improve the efficiency of radio spectrum utilization while addressing new challenges in energy efficiency and security, thus enabling spectrum access for all users and devices, and allowing traditionally underserved Americans to benefit from wireless-enabled goods and services. The SpecEES program solicitation (pronounced "SpecEase") seeks to fund innovative collaborative research that transcends the traditional boundaries of existing programs.
Awards: Standard Grants. Anticipated funding amount: $10,000,000
Letter of Intent: Not Required
Full Proposal Submission Due Date: January 19, 2017
Contacts:

- Chengshan Xiao, ENG/ECCS, telephone: (703) 292-8339, email: cxiao@nsf.gov
- Hao Ling, ENG/ECCS, telephone: (703) 292-8339, email: hling@nsf.gov

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Grant Program: Transdisciplinary Research in Principles of Data Science Phase I (TRIPODS)
Agency: National Science Foundation NSF 16-615
RFP Website: https://www.nsf.gov/pubs/2016/nsf16615/nsf16615.htm
Brief Description: *Transdisciplinary Research In Principles Of Data Science* (TRIPODS) aims to bring together the statistics, mathematics, and theoretical computer science communities to develop the theoretical foundations of data science through integrated research and training activities. Phase I, described in this solicitation, will support the development of small collaborative Institutes. Phase II (to be described in an anticipated future solicitation, subject to availability of funds) will support a smaller number of larger Institutes, selected from the Phase I Institutes via a second competitive proposal process. All TRIPODS Institutes must involve significant and integral participation by all three of the aforementioned communities.
Awards: Standard Grants. Anticipated funding amount: $12,000,000
Letter of Intent: Submission of Letters of Intent is required. Please see the full text of this solicitation for further information. January 04, 2017 - January 19, 2017
Full Proposal Submission Due Date: March 01, 2017 - March 15, 2017
Contacts:

- Nandini Kannan, Program Director, Division of Mathematical Sciences, telephone: (703) 292-8104, email: nakannan@nsf.gov
- Tracy Kimbrel, Program Director, Division of Computing and Communication Foundations, telephone: (703) 292-8910, email: tkimbrel@nsf.gov

Grant Program: Plant Genome Research Program (PGRP)
Agency: National Science Foundation and National Institutes of Health NSF 16-614
RFP Website: https://www.nsf.gov/pubs/2016/nsf16614/nsf16614.htm
Brief Description: The Plant Genome Research Program (PGRP) supports genome-scale research in plant genomics that addresses challenging questions of biological importance and of relevance to society. The Program encourages the development of innovative tools, technologies and resources that push the boundaries of research capabilities and permit the community to answer seemingly intractable and pressing questions on a genome-wide scale. Emphasis is placed on the creativity of the approach and the scale and depth of the question being addressed. Data produced by plant genomics should be usable, accessible, integrated across scales and of high impact across biology. Training and career advancement in plant genomics is featured as an essential element of scientific progress. The PGRP continues to focus on plants of economic importance and biological processes and interactions that will have broad impact on the scientific research community and society in general.
Awards: Standard Grants. Anticipated funding amount: $15,000,000
Letter of Intent: Not Required
Full Proposal Submission Due Date: Anytime
Contacts:

- Diane Jofuku Okamuro, Program Director, 685N, telephone: (703) 292-4400, email:dbipgr@nsf.gov
- Anne Sylvester, Program Director, 675.01N, telephone: (703) 292-4400, email: dbipgr@nsf.gov

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Grant Program: Designing Materials to Revolutionize and Engineer our Future (DMREF)
Agency: National Science Foundation NSF 16-613
RFP Website: https://www.nsf.gov/pubs/2016/nsf16613/nsf16613.htm
Brief Description: DMREF is the primary program by which NSF participates in the Materials Genome Initiative (MGI) for Global Competitiveness. MGI recognizes the importance of materials science and engineering to the well-being and advancement of society and aims to "deploy advanced materials at least twice as fast as possible today, at a fraction of the cost." MGI integrates materials discovery, development, property optimization, and systems design with a shared computational framework. This framework facilitates collaboration and coordination of research activities, analytical tools, experimental results, and critical evaluation in pursuit of the MGI goals. The MGI Strategic Plan highlights four sets of goals:

- Leading a culture shift in materials science research to encourage and facilitate an integrated team approach;
- Integrating experimentation, computation, and theory and equipping the materials community with advanced tools and techniques;
- Making digital data accessible; and
- Creating a world-class materials science and engineering workforce that is trained for careers in academia or industry.

Accordingly, DMREF will support activities that accelerate materials discovery and/or development by building the fundamental knowledge base needed to design and make materials with specific and desired functional properties from first principles. This will be accomplished through forming interdisciplinary teams of researchers working synergistically in a "closed loop" fashion, building a vibrant research community, leveraging Big Data science, providing ready

access to materials data, and educating the future MGI workforce. Specifically, achieving this goal will involve modeling, analysis, and computational simulations, validated and verified through sample preparation, characterization, and/or device demonstration. DMREF will enable development of new data analytic tools and statistical algorithms; advanced simulations of material properties in conjunction with new device functionality; advances in predictive modeling that leverage machine learning, data mining, and sparse approximation; data infrastructure that is accessible, extensible, scalable, and sustainable; the development, maintenance, and deployment of reliable, interoperable, and reusable software for the next-generation design of materials; and new collaborative capabilities for managing large, complex, heterogeneous, distributed data supporting materials design, synthesis, and longitudinal study.
Awards: Standard Grants. Anticipated funding amount: $29,400,000
Letter of Intent: Not Required
Full Proposal Submission Due Date: January 03, 2017 - January 17, 2017
Contacts:

- John Schlueter, Team Lead, MPS/DMR, 1080N, telephone: (703) 292-7766, email:jschluet@nsf.gov
- Almadena Chtchelkanova, CISE/CCF, 1115N, telephone: (703) 292-8910, email:achtchel@nsf.gov

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Grant Program: Emerging Frontiers In Research And Innovation 2017 (EFRI-2017)
Agency: National Science Foundation NSF 16-612
RFP Website: https://www.nsf.gov/pubs/2016/nsf16612/nsf16612.htm
Brief Description: The Emerging Frontiers in Research and Innovation (EFRI) program of the NSF Directorate for Engineering (ENG) serves a critical role in helping ENG focus on important emerging areas in a timely manner. This solicitation is a funding opportunity for interdisciplinary teams of researchers to embark on rapidly advancing frontiers of fundamental engineering research. For this solicitation, we will consider proposals that aim to investigate emerging frontiers in the following two research areas:

- **Advancing Communication Quantum Information Research in Engineering**(ACQUIRE)
- **New Light, EM (Electronic) and Acoustic Wave Propagation: Breaking Reciprocity and Time-Reversal Symmetry** (NewLAW)

This solicitation will be coordinated with the Directorate for Mathematical & Physical Sciences (MPS) and the Directorate for Computer and Information Science and Engineering (CISE), within NSF.
EFRI seeks proposals with transformative ideas that represent an opportunity for a significant shift in fundamental engineering knowledge with a strong potential for long term impact on national needs or a grand challenge. The proposals must also meet the detailed requirements delineated in this solicitation.
Awards: Standard Grants. Anticipated funding amount: $10,000,000
Letter of Intent: Submission of Letters of Intent is required. Please see the full text of this solicitation for further information. October 24, 2016
Preliminary Proposal Due Date(s) ***(required)***: December 21, 2016
Full Proposal Submission Due Date: March 24, 2017
Contacts:

- Sohi Rastegar, Director, ENG/EFMA, telephone: (703) 292-8305, email: srastega@nsf.gov
- Kerstin Mukerji, Program Manager, ENG/EFMA, telephone: (703) 292-5390, email:kmukerji@nsf.gov

- TOPIC 1:, Advancing Communication Quantum Information Research in Engineering (ACQUIRE), telephone: (703) 292-8339, email: ddagenai@nsf.gov

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Grant Program: Smart and Connected Communities (S&CC)
Agency: National Science Foundation NSF 16-610
RFP Website: https://www.nsf.gov/pubs/2016/nsf16610/nsf16610.htm
Brief Description: Cities and communities in the U.S. and around the world are entering a new era of transformational change, in which their inhabitants and the surrounding built and natural environments are increasingly connected by smart technologies, leading to new opportunities for innovation, improved services, and enhanced quality of life. The goal of this Smart & Connected Communities (S&CC) solicitation is to support strongly interdisciplinary, integrative research and research capacity-building activities that will improve understanding of smart and connected communities and lead to discoveries that enable sustainable change to enhance community functioning. Unless stated otherwise, for the purposes of this year's solicitation, communities are physical, geographically-defined entities, such as towns, cities, or incorporated rural areas, consisting of various populations, with a governance structure and the ability to engage in meaningful ways with the proposed research.

Successful S&CC projects are expected to pursue research and research capacity-building activities that integrate multiple disciplinary perspectives and undertake meaningful community engagement, and to include appropriate and robust evaluation plans for assessing activities and outcomes. To meet the multidisciplinary criterion, proposals must meaningfully integrate across both social and technological research dimensions. In this solicitation, the social dimensions reflect areas typically included in the portfolios of the NSF's Directorates for Social, Behavior, and Economic Sciences (SBE) and Education and Human Resources (EHR), while the technological dimensions reflect disciplinary areas typically included in the portfolios of the Directorates for Computer and Information Science and Engineering (CISE) and Engineering (ENG). Proposals may also pursue integration with other disciplines as needed, including but not limited to those typically encompassed in the portfolio of the NSF's Directorate for Geosciences (GEO). Successful proposals are also expected to include appropriate community engagement as defined further in the solicitation.
Awards: Standard Grants. Anticipated funding amount: $18,000,000
Letter of Intent: Not Required
Full Proposal Submission Due Date:

- **Preliminary Proposal Due Date(s)** ***(required)*** (due by 5 p.m. submitter's local time): November 30, 2016
- **Full Proposal Deadline(s)** (due by 5 p.m. submitter's local time): February 16, 2017

Contacts:

- David Corman, Program Director, CISE/CNS, telephone: (703) 292-8754, email:dcorman@nsf.gov
- Nicholas Anderson, Program Director, GEO/AGS, telephone: (703) 292-4715, email:nanderso@nsf.gov
- Radhakishan Baheti, Program Director, ENG/ECCS, telephone: (703) 292-8339, email:rbaheti@nsf.gov
- Wendy Nilsen, Program Director, CISE/IIS, telephone: (703) 292-2568, email: wnilsen@nsf.gov

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National Institutes of Health

Grant Program: NIH-CASIS Coordinated Microphysiological Systems Program for Translational Research in Space (UG3/UH3)
Agency: National Institutes of Health RFA-TR-16-019
RFP Website: http://grants.nih.gov/grants/guide/rfa-files/RFA-TR-16-019.html
Brief Description: Among the areas of research encouraged in this proposed initiative are translational research examining the mechanisms that underlie the effects of diseases or conditions associated with bone and cartilage, skeletal muscle, brain, gastrointestinal tract, lung, liver, microvasculature, skin, or other tissues, as well as research designed to improve the translation of existing knowledge of strategies for the prevention and treatment of such diseases or conditions.

It is possible, through research at the ISS-NL, to exploit space-specific phenomena to conduct inflight studies using tissue chips that include:

- Altered gene expression to study biological processes, such as virulence, or protein and antibiotic production
- How cell cultures respond to space-related stressors and various altered processes
- Use 3-D tissue cultures to repeat ground-based studies of pharmaceutical effectiveness, necrosis and tissue growth techniques
- Study microgravity-induced health conditions to inform the treatment of ailments such as osteoporosis, immunosuppression and shingles, as well as the prevention of age-induced physiological changes
- Novel pharmaceutical design/targets based on a better understanding of pathogenesis, as well as improved production methods and higher sensitivity and specificity of drugs
- Development of viral vaccines and new drug treatments using tissue chips
- Elucidation of biological pathways and characteristics of cell interactions
- Increased translational relevance of studies on cell/tissue behavior and response to stimuli (such as pharmaceutical testing)
- Advanced tissue engineering and regeneration using tissue chip technologies
- Design of approaches to improve wound healing
- Advancements in therapeutic approaches to diseases on Earth and anti-aging biology
- Post flight recovery of tissue chips for genomic, proteomic, metabolomic, epigenomic and histological analysis
- Capability to integrate remote monitoring and control of on-orbit tissue chips from the ground

Each UG3/UH3 application should be structured to meet the NIH-CASIS program goals. It is anticipated that the UG3 phase will involve studies on ground development of tissue chip technology under microgravity environments which includes working with CASIS ISS Implementation Partners, testing and pilot experiments under simulated environments, flight integration, conduct of experiments at the ISS-NL, and post flight analyses. Successful UG3 projects will transition into the UH3 phase for re-flight and more extensive experiments and analyses.

The models are expected to express critical aspects of human physiology and provide a measurable output for the representative systems. In developing tissue chip models that more accurately represent human physiology and pathology, primary tissues obtained from patients may be used; however, investigators are strongly encouraged to take advantage of recent advances with human stem cells, progenitor cells, induced pluripotent stem cells (iPSC), and gene editing technologies to engineer tissues whenever feasible. Essential characteristics of the

models should include all or some of the following features: 1) multicellular architecture that represents characteristics of the tissues or organs of pathology; 2) functional representation of normal and diseased human biology; 3) reproducible and viable operation under physiological conditions maintained up to 4 weeks in culture; 4) accurate representation of normal and disease phenotypes; and 5) representation of diversity or heterogeneity of human population. Ideally the platform used should be compatible for operation at the ISS-NL using ground-based controls, or transmit to ground control assay outputs that include multiple molecular read-outs, such as gene expression, proteomic, metabolomic, or epigenomic analyses. The bioengineered platform should also provide spatial and temporal control of the cellular microenvironment, while enabling continuous monitoring (sensing), probing (direct in-cell measurements), and sampling (testing and continuous data collection and analysis) of the system.
Awards: Application budgets are limited to $500,000 direct cost.
Letter of Intent: November 15, 2016.
Deadline: December 15, 2016, 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: New Technologies and Novel Approaches for Large-Scale Recording and Modulation in the Nervous System (U01)
Agency: National Institutes of Health RFA-NS-17-003
RFP Website: http://grants.nih.gov/grants/guide/rfa-files/RFA-NS-17-003.html
Brief Description: This FOA is related to the recommendations in section III of the BRAIN 2025 Report, with the goal to 'produce a dynamic picture of the functioning brain by developing and applying improved methods for large-scale monitoring of neural activity'. Towards this end, the report calls for accelerated development of new and improved electrodes for large-scale recording, new and improved electrical and chemical optical sensors of neural activity, and new and improved instruments for optical monitoring of neural activity. These new technologies and approaches will provide unprecedented opportunities for exploring how the nervous system encodes, processes, utilizes, stores, and retrieves vast quantities of information. A better understanding of this dynamic neural activity will enable researchers to seek new ways to diagnose, treat, and prevent brain disorders. Moreover, this FOA is intended to support the core principles of technology validation and dissemination highlighted in the BRAIN 2025 Report.
This FOA seeks applications to conduct proof-of-concept development and testing 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.
An additional BRAIN FOA (RFA-NS-17-004) solicits applications for iterative refinement and validation of existing and emerging technologies for large-scale recording and manipulation of neural activity.

Applications are expected to address any or all of the following three general goals for the FOA:

1. Develop New Large-Scale Network Recording Capabilities

Recording dynamic neural activity from complete neural networks, over long periods, in any area of the brain is a challenging but essential goal. Advances in the exploration and development of new technologies for neural cell recording, including methods based on electrodes, microelectronics/microchips, imaging, molecular genetics, and nanoscience are

encouraged. It is expected that progress will initially be tractable in non-human animals (invertebrate or vertebrate), but extrapolation to human circuits is an ultimate goal.

2. Develop Tools for Circuit Manipulation

The ability to activate and inhibit specific populations of neurons is key to understanding functional circuits, which will advance the scope of our knowledge from observation of neural phenomena to a mechanistic understanding of neural causation. A new generation of tools for optogenetics, pharmacogenetics, biochemical, electromagnetic and/or acoustic modulation needs to be developed for use in animals, and eventually in humans, to enable the immense potential of circuit manipulation.

3. Link Neural Activity to Behavior

The goal of this FOA is to produce technologies with potential to elucidate nervous system function, in health and disease, in the context of complex behaviors. Proposed technologies should be compatible with experiments in behaving animals and should be validated under *in vivo* experimental conditions. In addition, novel approaches for enabling large-scale neural recording or manipulation during complex behaviors are encouraged along with the computational and statistical tools necessary to link neural activity to behavior. In combination with concurrent measurement and manipulation of neuronal activity, applications may propose methods to enhance the ability to quantify and interpret animal behavior, at high temporal and spatial resolution, reliably and objectively, over long periods of time and under a broad set of conditions.

Awards: Application budgets are not limited but need to reflect the actual needs of the proposed project.

Letter of Intent: 30 days prior to the application due date.

Deadline: December 21, 2016, and October 18, 2017, by 5:00 PM local time of applicant organization. Alltypes 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: Integration and Analysis of BRAIN Initiative Data (R24)
Agency: National Institutes of Health RFA-MH-17-257

RFP Website: http://grants.nih.gov/grants/guide/rfa-files/RFA-MH-17-257.html

Brief Description: This FOA is one of three related FOAs aimed at building the informatics infrastructure for the BRAIN Initiative. Each of these FOAs is aimed at building an infrastructure that will be used by a particular sub-domain of experimentalists rather than building a single all-encompassing informatics infrastructure now. Building the infrastructure one experimental area at a time will ensure that the infrastructure is immediately useful to components of the research community. As our understanding of the brain improves, it may be possible to create linkages between these various sub-domain specific informatics efforts. Applicants to any of these informatics FOAs should keep that goal in mind and build for the future even though the current efforts are more limited in scope.

The first FOA will create the data standards that are needed to describe the new experiments that are being created by or used in the BRAIN Initiative (this FOA). The second FOA will create the data infrastructures that will house the data from multiple experimental groups (RFA-MH-17-255). The final FOA (RFA-MH-17-257) supports the development of software to visualize and analyze the data. The visualization/data analysis tools will make use of the standards and will be built so that they can be integrated into the data repositories; similarly, the data repositories are expected to use the standards created in awards under the

first FOA. Awardees under all FOAs will work together. Awardees in all groups should budget for hackathons and other collaborative efforts that will be necessary to integrate the products produced by all awardees. Collaborations with neuro-informatics efforts outside of the BRAIN Initiative are both welcome and are encouraged.

This FOA can be used to support several different, but related activities. These include modifying existing analysis and visualization tools to deal with BRAIN Initiative data and integrating different types of BRAIN Initiative datasets. It is also possible to propose the development of new tools, but that pathway may take longer than adapting existing tools that have already been developed and tested. The tools must make use of relevant standards.

Tools that integrate different types of data may link data across multiple scales or across different species. The focus for integration tools in this FOA is mainly in finding the data and applying metrics for data alignment, standardization and normalization for further analysis. Applicants who want to focus on the development of tools to analyze data across multiple scales should look at other FOAs such as those listed athttps://www.imagwiki.nibib.nih.gov/.

The tools must be user-friendly in accessing and analyzing data from appropriate data archives. Ultimately, it is expected that much of the BRAIN Initiative data will be stored in a cloud environment, but that may not be initially true. In general, the tools supported under this FOA should analyze/visualize data without the need to download them. The tools should allow data to be combined for analysis/visualization from multiple locations.

Sub-domains that might be ready for the development of data analysis and visualization tools include but are not limited to:

- Integrated approaches to understanding circuit function in the nervous system. This would include awards made in responses to RFA-NS-14-009, RFA-NS-15-005, as well as awards that are anticipated in a second phase of the program.
- Invasive devices for recording and modulation in the human central nervous system. This would include awards made in response to RFA-NS-15-006, RFA-NS-15-008, RFA-NS-16-008, RFA-NS-16-009, and RFA-NS-16-010.
- Non-invasive neuromodulation. This would include awards made in response to RFA-MH-16-810 and RFA-MH-16-815.
- Next generation imaging. This may include awards made in response to RFA-MH-14-217, RFA-MH-15-200, as well as awards that are anticipated in a second phase of the program. It might be possible to include awards made in response to RFA-MH-16-750 in this sub-domain as well.

This list is focused on awards made under existing BRAIN Initiative focus areas. The list is not exhaustive and other sub-domains of similar size and complexity related to the BRAIN Initiative are welcome.

Examples of activities that might be supported under this sort of application include:

- Modification of software that was originally used in a particular laboratory to run in a cloud environment and to accept data from multiple sources.
- Modification of software to make use of standards that are now being used to describe BRAIN Initiative experiments.
- Extension of software that was originally used to analyze/visualize data from outside the BRAIN Initiative to accept BRAIN Initiative data.
- Modification of software where the user can perform dynamical exploration of a space described by multiple parameters simultaneously.
- Modification of software to enable biophysical parameter fitting and extraction.
- Development or extension of tools that are able to perform un-biased cluster analysis and visualization of functional mechanisms in the brain.

- Development or extension of tools that are able to predict and visualize future trends based on the current state of the system.
- Creation of new software to analyze and visualize BRAIN initiative data.
- Development or extension of tools to link different types of data relevant to the BRAIN Initiative. These tools could:
- allow searches across multiple data repositories for data relevant to a researcher. However, tools that focus on the development of broad ontologies will not be responsive and will be withdrawn prior to peer review. Applications that focus on the development of a narrow ontology for a particular purpose are an acceptable component of an application.
- develop new methods to find and link data at different scales such linking individual cell level data to data about meso-scale constructs such as circuits and networks.

The intent of this FOA is to develop tools that can be used by the research community at large. Applications that are focused on applying the tool to answer research questions are non-responsive and will be withdrawn prior to peer review.

Awards: Application budgets are not limited but need to reflect the actual needs of the proposed project.

Letter of Intent: 30 days prior to the application due date.

Deadline: January 19 2017 and October 26, 2017, by 5:00 PM local time of applicant organization. Alltypes of non-AIDS applications allowed for this funding opportunity announcement are due on these dates.

No late applications will be accepted for this Funding Opportunity Announcement.

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: New Concepts and Early-Stage Research for Large-Scale Recording and Modulation in the Nervous System (R21)

Agency: National Institutes of Health RFA-EY-17-001

RFP Website: http://grants.nih.gov/grants/guide/rfa-files/RFA-EY-17-001.html

Brief Description: This FOA is related to sections II.2, II.3, and II.4 from the BRAIN 2025 Report. These three recommendations call for accelerated development of new large-scale recording technologies and tools for neural circuit manipulation. These new technologies and approaches will provide unprecedented opportunities for exploring how the nervous system encodes, processes, utilizes, stores, and retrieves vast quantities of information. A better understanding of this dynamic neural activity will enable researchers to seek new ways to diagnose, treat, and prevent brain disorders.

Achieving these goals requires the ability to record simultaneously from thousands or tens-of- thousands of neurons contributing to the dynamic activity in a neural circuit. The relevant activity may be in clusters of cells packed closely together or may be in widely distributed circuits. Current microelectrode and imaging technologies are limited in the number of cells from which activity can be isolated and sampled simultaneously, by the size or location of the area to be sampled, by the depth of penetration, and by the invasiveness of the technique that might prohibit their use in human experimentation. Non-invasive technologies suitable for use in humans are currently limited in spatial resolution and temporal dynamics, as well as in their reflection of on-going electrical activity in circuit elements. This FOA seeks entirely new ideas, concepts and/or approaches from physics and engineering, and biology, for how these limitations might be overcome to enable increased recording capabilities on the scale of one or more orders of magnitude beyond that of current technology.

Dissecting the function of neural circuits also requires the ability to manipulate neural activity in order to investigate underlying mechanisms and demonstrate causality. Current technologies such as microstimulation and optogenetic approaches are limited in specificity, temporal dynamics, and by the invasiveness of the technique. This FOA also seeks novel ideas for technology capable of manipulating activity in circuits that overcome the limitations of current invasive and non-invasive approaches.

Applications are expected to propose the development of ideas in the earliest stages for entirely new approaches for large-scale neural recording and/or manipulation of neural activity. Such ideas could encompass unique and innovative combinations of existing technology that create a synergistic result. An important goal is to stimulate new thinking and concepts for accelerating development of novel technologies that break current barriers to neural recording and/or manipulation. In addition to experimental approaches, this FOA may support early-stage testing using calculations, simulations, computational models, or other mathematical techniques for demonstrating that the signal sources and/or measurement technologies are theoretically capable of meeting the demands of large-scale recording or manipulation of circuit activity in humans or animal models. The support might also be used for building and testing phantoms, prototypes, in-vitro or other bench-top models in order to validate underlying theoretical assumptions in preparation for future FOAs aimed at proof-of concept testing in animal models. Preliminary data is not expected for ideas in these very early stages of development.

Applications are expected to propose research that will explore ideas in their earliest stages of development in order to be responsive to goals and objectives of this FOA. Applications proposing work that does not meet the goals of this FOA will be deemed non-responsive and will not be reviewed. Some examples of non-responsive applications might be: i) further development of existing technology; ii) hypothesis-testing; iii) validation and/or refinement of current technology; or iv) development of analytical methods to be applied to existing technology and/or data.

The technologies that would ultimately evolve from these new approaches should be compatible with experiments in humans and/or behaving animals, and should dramatically increase the capacity for recording and manipulating neural activity in order to enable experiments that are currently not possible.

Applications from individuals not usually associated with neuroscience research or teams that cross boundaries forming interdisciplinary collaborations capable of bringing new and untested ideas are particularly encouraged. Accordingly, applicants might consider, where appropriate, multi-PD/PI applications that integrate appropriate expertise, including but not limited to biological, chemical and physical sciences, engineering, computational modeling and statistics.

Awards: The combined budget for direct costs for the two-year project period may not exceed $300,000. No more than $200,000 may be requested in any single year.

Letter of Intent: Not Required.

Deadline: December 7, 2016, 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.

Department of Defense/US Army/DARPA/ONR

Grant Program: Young Faculty Award (YFA)
Agency: Department of Defense DARPA DARPA-BAA-16-63

Website:
https://www.fbo.gov/index?s=opportunity&mode=form&id=3a993177b2e9509708914b197bb2a86c&tab=core&_cview=0

Brief Description: Participation is open to individuals who are U.S. Citizens, U.S. Permanent Residents, and Foreign Nationals at U.S. Institutions who meet the eligibility criteria listed below: -Proposers must be Tenure Track Assistant/Associate Professors or their equivalent at non-profit research institutions. -By the full proposal deadline of January 18, 2017, proposers must be within 8 years of their tenure-clock/appointment start date at a U.S. Institution, excluding any personal leaves of absence. -Previous YFA Award recipients are not eligible for this or any future YFA program. -Former DARPA Program Managers are not eligible to apply for funding under this program. -Non-U.S. individuals may participate to the extent that such participants comply with any necessary nondisclosure agreements, security regulations, export control laws, and other governing statutes applicable under the circumstances. -PIs are limited to one executive summary and one full proposal submission to this RA; a proposer is strongly encouraged to submit an executive summary in advance of a full proposal to determine DARPA's interest and minimize the effort and expense of preparing an out of scope proposal. -Recipients of non-YFA DARPA awards are eligible to propose. Proposers must provide a listing of federal support (past, current, and pending). This list must include the sponsor, amount, and performance dates of all federally-funded research efforts and should be present on the submission cover sheet as indicated in Section IV of Research Announcement DARPA-RA-16-63.

The Defense Advanced Research Projects Agency (DARPA) is soliciting innovative research proposals in the areas of physical sciences, engineering, materials, mathematics, biology, computing, informatics, social science, and manufacturing of interest to DARPA's Defense Sciences Office (DSO), Microsystems Technology Office (MTO), and Biological Technologies Office (BTO).

The Defense Advanced Research Projects Agency (DARPA) Young Faculty Award (YFA) program aims to identify and engage rising stars in junior faculty positions in academia and equivalent positions at non-profit research institutions and expose them to Department of Defense (DoD) and National Security challenges and needs. In particular, this YFA will provide high-impact funding to elite researchers early in their careers to develop innovative new research directions in the context of enabling transformative DoD capabilities. The longterm goal of the program is to develop the next generation of scientists and engineers in the research community who will focus a significant portion of their future careers on DoD and National Security issues. DARPA is particularly interested in identifying outstanding researchers who have previously not been performers on DARPA programs, but the program is open to all qualified applicants with innovative research ideas.

Awards: each award will include funding for a 24- month base period (a maximum of $500,000) and a 12-month option period (a maximum of $500,000).

Deadline:
Executive Summary Due Date: November 1, 2016, 4:00 p.m.
FAQ Submission Deadline: January 11, 2017, 4:00 p.m. See Section VIII.A.
Full Proposal Due Date: January 18, 2017, 4:00 p.m.

Contact: Technical POC: RA Coordinator, DARPA/DSO • Solicitation Email: YFA2017@darpa.mil

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Grant Program: Long Range Broad Agency Announcement (BAA) for Navy and Marine Corps Science and Technology
Agency: Department of Defense Office of Naval Research N00014-17-S-B001

Website: http://www.onr.navy.mil/~/media/Files/Funding-Announcements/BAA/2017/N00014-17-S-B001.ashx
Brief Description: The Office of Naval Research (ONR) is interested in receiving proposals for Long-Range Science and Technology (S&T) Projects which offer potential for advancement and improvement of Navy and Marine Corps operations. Readers should note that this is an announcement to declare ONR's broad role in competitive funding of meritorious research across a spectrum of science and engineering disciplines. A brief description of the ONR Program Codes and the science and technology thrusts that ONR is pursuing is provided below. Additional information can be found at the ONR website at http://www.onr.navy.mil/Science-Technology/Departments.aspx. Potential offerors are urged to check the program areas that they are interested in throughout the year for updates to thrust areas and research priorities on the ONR website at http://www.onr.navy.mil. Prior to preparing proposals, potential offerors are strongly encouraged to contact the ONR technical point of contact (POC). To identify the POC, follow the link for the appropriate code or division listed below and then click on the link to the thrust or topic area. Each thrust or topic area will provide a POC or e-mail address.
Awards: Various
White Paper Submission: Electronic (email) submissions should be sent to the attention of the Technical POC at: Email Address of the Technical POC, e.g. Jane.Doe@navy.mil . The subject line of the email shall read "N00014-17-S-B001 White Paper Submission". The white paper must be a Microsoft Word 2010 compatible, or PDF format attachment to the email. There is an email size limit of 5MB per email.
Deadline: Full proposals are required for submission. "White Papers" are frequently desired by ONR Program Officers. Offerors should consult the cognizant ONR Program Officer regarding the desirability of "White Paper" submissions or Oral Presentations. ONR departments are identified at http://www.onr.navy.mil/en/Science-Technology/Contacts.aspx
Contact: Technical POC: RA Coordinator, DARPA/DSO • Solicitation Email: YFA2017@darpa.mil

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Department of Energy

Grant Program: Sensor and Modeling Approaches for Enhanced Observability and Controllability of Power Systems with Distributed Energy Resources (DERs)
Agency: Department of Energy DE-FOA-0001616
Website:
https://www.fedconnect.net/FedConnect/PublicPages/PublicSearch/Public_OpportunitySummary.aspx?ReturnUrl=%2ffedconnect%3fdoc%3dDE-FOA-0001616%26agency%3dDOE&doc=DE-FOA-0001616&agency=DOE
Brief Description: The Department of Energy's (DOE's) National Energy Technology Laboratory (NETL) intends to issue a FOA on behalf of the DOE Office of Electricity Delivery and Energy Reliability (OE) titled "Sensor and Modeling Approaches for Enhanced Observability and Controllability of Power Systems with Distributed Energy Resources (DERs)."

Funding Opportunity Announcement DE-FOA-0001616The Department of Energy (DOE), National Energy Technology Laboratory (NETL), on behalf of the Office of Electricity Delivery and Energy Reliability (OE), is seeking applications under this Funding Opportunity Announcement (FOA), herein referred to as Announcement, to conduct research, development and demonstrations (RD&D). This RD&D, in the areas of low cost sensors and improved modeling using sensor data input, will lead to enhanced observability and controllability of power systems to support increased hosting capacity for distributed energy resources (DERs),

including energy storage. Capturing the benefits commonly attributed to DERs and/or microgrids, as well as establishing new value propositions that could be enabled by these RD&D efforts is the focus of this FOA. New value propositions could include, but are not limited to, mitigating ancillary resource requirements and meeting the growing demand for reliable and resilient grid operations against outages under all-hazards conditions.
Award: Up to $1,500,000
Deadline: November 10, 2016.
Contact Information: Harolynne Blackwell 412-386-4829 blackwel@netl.doe.gov

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NASA

Grant Program: ROSES 2016: Interdisciplinary Science for Eclipse 2017
Agency: NASA NNH16ZDA001N-ISE
Website:
https://nspires.nasaprs.com/external/solicitations/summary.do?method=init&solId={4FF8585C-94E8-5CEA-C67F-9561B2E4A8D7}&path=init
Brief Description: This ROSES NRA (NNH16ZDA001N) solicits basic and applied research in support of NASA's Science Mission Directorate (SMD). This NRA covers all aspects of basic and applied supporting research and technology in space and Earth sciences, including, but not limited to: theory, modeling, and analysis of SMD science data; aircraft, scientific balloon, sounding rocket, International Space Station, CubeSat and suborbital reusable launch vehicle investigations; development of experiment techniques suitable for future SMD space missions; development of concepts for future SMD space missions; development of advanced technologies relevant to SMD missions; development of techniques for and the laboratory analysis of both extraterrestrial samples returned by spacecraft, as well as terrestrial samples that support or otherwise help verify observations from SMD Earth system science missions; determination of atomic and composition parameters needed to analyze space data, as well as returned samples from the Earth or space; Earth surface observations and field campaigns that support SMD science missions; development of integrated Earth system models; development of systems for applying Earth science research data to societal needs; and development of applied information systems applicable to SMD objectives and data. Awards range from under $100K per year for focused, limited efforts (e.g., data analysis) to more than $1M per year for extensive activities (e.g., development of specialized science experimental hardware). The funds available for awards in each program element offered in this NRA range from less than one to several million dollars, which allow selection from a few to as many as several dozen proposals, depending on the program objectives and the submission of proposals of merit. Awards will be made as grants, cooperative agreements, contracts, and inter- or intraagency transfers, depending on the nature of the work proposed, the proposing organization, and/or program requirements. The typical period of performance for an award is three years, but some programs may allow up to five years and others specify shorter periods. Organizations of every type, domestic and foreign, Government and private, for profit and not-for-profit, may submit proposals without restriction on teaming arrangements. Note that it is NASA policy that all investigations involving non-U.S. organizations will be conducted on the basis of no exchange of funds. Electronic submission of proposals is required by the respective due dates for each program element and must be submitted by an authorized official of the proposing organization. Electronic proposals may be submitted via the NASA proposal data system NSPIRES or via Grants.gov. Every organization that intends to submit a proposal in response to this ROSES NRA must be registered with

NSPIRES; organizations that intend to submit proposals via Grants.gov must be registered with Grants.gov, in addition to being registered with NSPIRES. Such registration must identify the authorized organizational representative(s) who will submit the electronic proposal. All principal investigators and other participants (e.g., co-investigators) must be registered in NSPIRES regardless of submission system. Potential proposers and proposing organizations are urged to access the system(s) well in advance of the proposal due date(s) of interest to familiarize themselves with its structure and enter the requested information. Details of the solicited programs are given in the Appendices of this ROSES NRA. Names, due dates, and links for the individual calls are given in Tables 2 and 3 of this ROSES NRA. Interested proposers should monitor http://nspires.nasaprs.com/ or subscribe to the electronic notification system there for additional new programs or amendments to this ROSES NRA through February 2017, at which time release of a subsequent ROSES NRA is planned. A web archive (and RSS feed) for amendments, clarifications, and corrections to this ROSES NRA will be available at: http://nasascience.nasa.gov/researchers/sara/grant-solicitations/roses-2016/ Frequently asked questions about ROSES-2016 will be on the web at http://science.nasa.gov/researchers/sara/faqs/. Further information about specific program elements may be obtained from the individual Program Officers listed in the Summary of Key Information for each program element in the Appendices of this ROSES NRA and at http://science.nasa.gov/researchers/sara/program-officers-list/.

A Step-1 proposal is required and must be submitted electronically by the Step-1 due date (see below and Tables 2 and 3 in the ROSES-2016 Summary of Solicitation). The Step-1 proposal must be submitted by the organization Authorized Organizational Representative (AOR). No budget or other elements are required. Only proposers who submit a Step-1 proposal are eligible to submit a full proposal. Step-1 proposals will be checked for compliance, but they will not be evaluated. The Step-1 proposal title, science goals, and investigators (Principal Investigator (PI), Co- Investigators (Co-Is), Collaborators, Consultants, and Other Professionals) cannot be changed between the Step-1 and Step-2 proposals. The expected format and evaluation criteria are described below. Submission of the Step-1 proposal does not obligate the offerors to submit a Step-2 (full) proposal later.

Awards: ~ $0.8 M (Heliophysics contribution)
ISE Step-1 Proposal Deadline: October 27, 2016
ISE Step-2 Proposal Deadline: November 30, 2016
Contact: Questions concerning general ROSES NRA policies and procedures may be directed to Max Bernstein, Lead for Research, Science Mission Directorate, at sara@nasa.gov .

Microsoft

Grant Program: Azure for Research Award: Internet of Things
Agency: Microsoft
Website: https://www.microsoft.com/en-us/research/academic-program/internet-things-azure-research-awards/
Brief Description: Researchers and scientists are continuing to explore emerging challenges, basic research, and new applications related to the ubiquitous devices and networking that comprise the Internet of Things (IoT). Among the related research topics are the following:

- System design for E2E deployment of scaled IoT infrastructure
- Security and privacy for IoT scenarios
- Machine learning models to detect anomalies and other insights from IoT data

- Data visualization to gain insights from large IoT data sets
- IoT infrastructure design and deployment challenges in a variety of domains, such as industrial automation, connected cars, smart cities, healthcare, etc.
- Graduate and undergraduate curriculum for teaching cyber physical systems and Internet of Things technologies

The Microsoft Azure Internet of Things Research Award aims to support researchers working in the research domains mentioned above. Qualifying proposals will be awarded allocation of Microsoft Azure cloud resources including access to Azure IoT Hub and Suite, and additional services such as Azure Machine Learning, and Stream Analytics.
Deadline: October 15, 2016
Contact: Microsoft Contact: azurerfp@microsoft.com
NJIT Contact: Eric Blitz at blitz@njit.edu

Grant Program: Azure for Research Award: Data Science
Agency: Microsoft
Website: https://www.microsoft.com/en-us/research/academic-program/data-science-award/
Brief Description: Microsoft Research is excited to offer researchers the opportunity to apply for cloud computing resources to support their data-intensive research projects. We recognize that the current landscape of cloud-based research makes heavy use of data that can take advantage of Azure services and tools to efficiently drive insights. Specifically, we seek proposals for projects that use, but are not limited to, Azure Analytics services such as Machine Learning, Stream Analytics, Data Factory, Event Hubs, Notification Hubs, and HDInsight-based services. Projects can be in any research discipline, as long as they clearly articulate the data that the proposed research relies on, and the Azure-based analytics services that will be used.
Deadline: October 15, 2016
Contact: Microsoft Contact: azurerfp@microsoft.com
NJIT Contact: Eric Blitz at blitz@njit.edu
