

NJIT Research Newsletter

Issue: ORN-2016-039

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/>

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NJIT Office of Research Event Calendar Save the Date

NJIT Faculty Research Advisory Board Meeting:

November 14, 2016; 12.00 PM – 1.30 PM; Ballroom B, Campus Center

NJIT 2016 Research Centers and Laboratories Showcase:

November 17, 2016; 10.30 AM – 2.30 PM; Ballroom B, Campus Center

Agenda:

10.00 AM- 10.30 AM: Uploading of power-point files on individual tables

10.30 AM - 10.45 AM: Introductions and Welcome

10.45 AM - 12.00 PM: Keynote Talk and Q&A: Dr. Nora Savage, Program Director, Biological and Environmental Interactions of Nanoscale Materials, Chemical, Bioengineering, Environmental and Transport Systems (CBET) Division, NSF

12.00 PM - 12.30 PM: Lunch and Networking

12.30 PM - 2.30 PM: Poster Session and Networking

Keynote Title: NSF– Nine Strategies for Funding

Abstract: The development and use of nanotechnology could have a dramatic impact on our global society, due to the potential to substantially improve the characteristics and performance of a number of systems and commercial products. Potential applications include medical imaging and therapies, environmental restoration and protection, electronics, energy storage, generation and distribution, food protection and production and water remediation and conservation. The Biological and Environmental Interactions of Nanoscale Materials is focused on enabling these advances through the acquisition of fundamental scientific knowledge elucidating the mechanistic behavior of nanoparticles. As society moves away from passive employment of nanoparticles in composites and materials towards active devices and structures, embedded with intelligence, this understanding becomes increasingly important.

This presentation will provide a description of the National Science Foundation funding opportunities, highlighting the Biological and Environmental Interactions of Nanoscale Materials Program within the Chemical, Bioengineering, Environmental and Transport Systems (CBET) Division in the Engineering Directorate. Tips for successful proposals will be offered. Details about specific programs offered by the Foundation will be shared as well as opportunities to interact with NSF. In addition, information concerning the National Nanotechnology Initiative will be provided along with unique opportunities to engage with the National Nanotechnology Coordination Office.

Speaker Biographical Sketch: Dr. Nora Savage obtained her bachelor's degree in Chemical Engineering in 1992 from Prairie View A&M University located in Prairie View, Texas. She received two Masters Degrees (in Environmental Engineering and Environmental Science) from the University of Wisconsin-Madison, located in Madison, Wisconsin in 1995, and a doctoral degree in Environmental Science from the same institution in 2000. Nora has worked for the U.S. federal government for almost twenty years. In this capacity she has served the environmental nanotechnology research community through her contributions to strategic research direction. Nora served as a Team Lead for nanotechnology within the Office of Research and Development within the U.S. Environmental Protection Agency. She currently serves as Program Director within the Engineering Directorate of the National Science Foundation.

Nora has authored and co-authored numerous articles on nanotechnology and emerging technologies in leading journals, including the Journal of Nanoparticle Research and Toxicological Sciences. She served as lead editor for the books "Emerging Technologies: Socio-Behavioral Life Cycle Approaches" and for "Nanotechnology for Water Applications" (now in its second edition) and has contributed chapters to several other books, including the Oxford Handbook of Nanoscience and Technology, vol. III.

Event: NJIT CBPE: 2016 KAPPE LECTURE SERIES: Maximizing Process Intensification and Resource Recovery- from Theory to Practice

When and Where: October 28, 2016, 2.30 PM – 4.00 PM; Room 112, Eberhardt

Speaker: Sudhir Murthy, PhD, PE, BCEE; Innovations Chief, DC Water

Abstract: In the past 100 years of water reclamation, improvement in treatment to meet new or more stringent permit requirements have used more resources, more land, more energy, and more chemicals. Rapid urbanization is pushing plants to seek out new approaches for better use of these resources as property values increase and there is little room to expand. In the United States, where plant capacity is determined by flow, water conservation is resulting in larger populations and therefore larger loads being served within the same flow. Often, the solids capacity for treatment is met before the liquid capacity. Re-tooling plants to provide adequate intensification has become an important goal. To achieve this intensification within existing infrastructure of concrete tanks built to last for 50-100 years provides additional challenges. Examples will be provided of new approaches for intensification that use or augment existing infrastructure in new ways. Understanding and addressing process limitations have been key in bringing about this intensification. Examples will be provided of opportunities for intensification of greater than 200% (while simultaneously reducing or maintaining the resources used) for nearly every major part of the wastewater treatment plant including preliminary/primary treatment, secondary treatment, nutrient removal, anaerobic digestion, and dewatering.

There is also a global interest in developing new approaches for resource recovery in wastewater. The Water Environment Federation has led the renaming of wastewater treatment plants (WWTP) to water resource recovery facilities (WRRF). The name change reflects a change in the mindset within the water sector, focusing on resource recovery as an essential element of

treatment. DC Water has embarked on a journey of maximizing resource recovered from used water by maximizing carbon redirection, intensifying anaerobic digestion with thermal hydrolysis, developing value products, heat and electrical energy.

This presentation will describe the continuing research journey for developing an intensification and resource recovery program within existing infrastructure at a large regional facility in Washington, DC, with little room to expand while meeting new stringent nutrient permits and managing combined sewer flows. The long-term sustainability of built infrastructure is dependent on the intensification that these approaches represent

Speaker Biographical Sketch: Dr. Murthy is the Innovations Chief at DC Water. He leads the development and implementation of the Authority's innovation strategy. Sudhir creates, defines, and translates research and development into new or improved facilities, products, services or revenue concepts. Dr. Murthy led the concept development for several programs at the 391 mgd Blue Plains advanced treatment plant that has led to nearly \$1 billion in engineered facilities.

Dr. Murthy has contributed to several WEF Manuals of Practice, organized conferences for IWA and WEF, and served on committees (he Chairs the IWA Nutrient Removal and Recovery Specialist Group) for several professional organizations. He has published nearly 100 peer reviewed papers, reports, and manuals, and has published over 300 articles. He has presented at numerous state, national, and international conferences.

Grant Opportunity Alerts

Keywords and Areas Included in the Grant Opportunity Alert Section Below

NSF MRI: Internal Competition

NSF: Advanced Biomanufacturing of Therapeutic Cells (ABTC); IUSE / Professional Formation of Engineers: REvolutionizing engineering and computer science Departments (IUSE/PFE: RED)

NIH: Systems Biology Approaches to Alzheimer's Disease Using Non-mammalian Laboratory Animals (R01); Common Mechanisms and Interactions Among Neurodegenerative Diseases (R01); Rehabilitation Research Career Development Programs (K12); BRAIN Initiative: Proof of Concept Development of Early Stage Next Generation Human Brain Imaging (R01)

Department of Defense/US Army/DARPA/ONR: DoD USAMRMC FY17 Broad Agency Announcement for Extramural Medical Research; Biological Technologies

Department of Energy: Scaling Up the Next Generation of Building Efficiency Packages

NASA: ROSES 2016: Solar System Working

McKnight Foundation: Technology Innovations in Neuroscience

Recent Research Grant and Contract Awards

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

PI: Michel Boufadel (PI)

Department: Center for Natural Resources Development and Protection

Grant/Contract Project Title: Workshop for Environmental Beijing Group

Funding Agency: FCC Group International, Inc.

Duration: 08/29/16-03/18/17

In the News...

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

Vice President Biden Delivers Cancer Moonshot Report, Announces Public and Private Sector Actions to Advance Cancer Moonshot Goals: Vice President Joe Biden delivered the Cancer Moonshot report to the President and the American public. The report summarizes the work of the Cancer Moonshot Task Force since its creation in January, and lays out the Vice President's strategic plan for transforming cancer research and care. The report also includes the Cancer Moonshot Blue Ribbon Panel's identified areas of scientific opportunity. Accompanying these findings and recommendations, the report includes the announcement of new commitments toward the goals of the Cancer Moonshot from both the public and private sectors. For example, today the National Cancer Institute, Amazon Web Services, and Microsoft are announcing a collaboration to build a sustainable model for maintaining cancer genomic data in the cloud. The information stored there will be available to cancer researchers through the NCI's Genomic Data Commons and Cancer Genomics Cloud programs.

The Department of Defense (DoD) is establishing a groundbreaking new study to transform our understanding of the biological basis of cancer. Using the vast amount of data housed within DoD's cancer registry database and biological sample collection, researchers will have at their fingertips potentially 250,000 samples to uncover new connections between the earliest signs of cancer. Findings can then be linked to information housed within the Environmental Protection Agency's databases to further accelerate our understanding of the environmental factors contributing to disease progression.

Crowdsourcing Intellectual Property Data to Guide Cancer Investments – In September, the U.S. Patent and Trademark Office (USPTO) launched the “USPTO Cancer Moonshot Challenge” to use intellectual property datasets to map and identify trending cancer technologies, enabling more precise funding and policy decisions regarding promising new treatments. With data and a new Cancer Treatment/Therapy API (Application Program Interface) released through the [USPTO Developer Hub](#), the challenge empowered app developers, academics, and coders to build rich visualizations of patent data—often an early indicator of meaningful R&D—and combine them with other economic and funding datasets. In September, USPTO and the Office of Science and Technology Policy (OSTP) announced three winners of the prize challenge who presented data-driven findings focused on how genetics and epidemiology of cancer related to rates of patenting of diagnostics, and how Federal funding of cancer research is amplified by dissemination of discovery through patenting. More information on the website <https://www.whitehouse.gov/the-press-office/2016/10/17/fact-sheet-vice-president-biden-delivers-cancer-moonshot-report> .

U.S. senators advance biomedical innovation bills, but key NIH funding issue unresolved: Lawmakers on the Health, Education, Labor and Pensions (HELP) committee held the last of three meetings to approve bills that, once bundled together, will form a companion to the House of Representatives's mammoth 21st Century Cures bill. [That legislation, which the House passed this past July](#) aims to spur medical breakthroughs through reforms at the National Institutes of Health (NIH) and the Food and Drug Administration.

But a final piece of the puzzle—a Senate agreement on how to increase funding for those agencies, and by how much—is still missing. The House version of 21st Century Cures includes \$8.75 billion in so-called mandatory spending for NIH, dedicated money not subject to annual appropriations which would be provided by selling oil from the nation's Strategic Petroleum Reserve. More information on: <http://www.sciencemag.org/news/2016/04/us-senators-advance-biomedical-innovation-bills-key-nih-funding-issue-unresolved>.

National Academies of : Both NASA and NSF have active smallsat programs and have played a role in the rapid development of this “disruptive technology”. In September, the National Academy of Sciences released a report entitled [*Achieving Science with CubeSats: Thinking Inside the Box*](#) which recommended that “..NASA should develop centralized management of the agency’s CubeSat programs...to create easier interfaces for CubeSat science investigators; provide more consistency to the integration, test, and launch efforts; and provide a clearinghouse for CubeSat technology, vendor information, and lessons learned...” This week, NASA Ames Research Center [announced plans](#) to establish a virtual institute to promote the development of small spacecraft technologies. The institute would act as a common portal for industry and academia to disseminate information on small spacecraft activities, lessons learned and small spacecraft collaborative opportunities. The institute would also be a clearinghouse and forum for smallsat policy issues such as space debris and future directions.

Concurrent with this announcement, the White House Office of Science and Technology Policy announced the [*“Harnessing the Small Satellite Revolution”*](#) initiative. Among the proposals included in the initiative, NASA would spend up to \$30 million to purchase smallsat data such as land imaging and radio occultation products. NOAA, the General Services Administration, and the Intelligence Advanced Research Projects Activity (IARPA) also announced special plans under the initiative. Full report is available on the website: <https://www.nap.edu/read/23503/chapter/2>

NSF Research Experiences for Undergraduates (REU) Supplemental Funding: The NSF Directorate for Computer and Information Science and Engineering (CISE) invites grantees with active CISE awards to submit requests for **Research Experiences for Undergraduates (REU) Supplemental** funding, following the guidelines in the NSF REU solicitation (see Research Experiences for Undergraduates (REU): Sites and Supplements; [NSF 13-542](#)). Awards under no cost extension (NCE) are not eligible for this supplement. A student must be a US citizen, or a permanent resident of the US. The duration for new requests is typically one year. The proposed start date for a supplement must be after the conclusion of all existing REU supplements on the corresponding active CISE award. Priority will be given to requests submitted before March 30, 2017; the potential for funding requests after this date will be limited. If requests for REU supplemental support exceed funds available in CISE, requests will be considered in the order received. REU supplement funds can be used at any time during the year. Annual and final reports for a project receiving REU supplements should provide a brief description of activities, impacts and outcomes (including number of support-months for each student) of REU supplement support.

REU stipend support helps retain talented students, while providing meaningful research experiences and encouraging research-based careers. The participation of students from groups underrepresented in computing -- underrepresented minorities, women, and persons with disabilities -- is strongly encouraged. In addition, CISE encourages REU supplements that specifically afford U.S. veterans an opportunity to engage in meaningful research experiences. For single investigator projects, CISE REU supplemental funding requests should typically be for no more than two students for one year. Research teams funded through multi-investigator projects may request support for a larger number of students, commensurate with the size and nature of their projects. Requests for larger numbers of students should be accompanied by detailed justifications.

CISE usually provides up to \$8,000 per student per year through the REU supplemental support mechanism (This amount usually covers stipend but a small portion of the fund can be used for other related purposes e.g.; student travel to a conference). As described in the REU

program solicitation ([NSF 13-542](#)), indirect costs (F&A) are not allowed on Participant Support costs in REU Site or REU Supplement budgets.

CISE REU supplemental funding requests must describe results of any previous such support, such as students supported, papers published, student placements, etc. Other factors influencing supplemental funding decisions include the number of REU requests received by CISE programs, and in the case of multiple submissions by a single PI, the ability to provide adequate mentoring.

Investigators are encouraged to refer to the REU program solicitation ([NSF13-542](#)) for detailed information concerning submission requirements. **Since supplemental funds requests are handled by the cognizant program officer overseeing the active award requesting the supplement, grantees should contact the cognizant program officers of their awards if they have questions or need additional information.**

Webinar and Events

Event: Amazon Web Services: Storage with Amazon S3 and Amazon Glacier

When: October 26, 2016 1.30 PM – 2.30 PM

Website:

https://publish.awswebcasts.com/content/connect/c1/7/en/events/event/shared/41150266/event_registration.html?connect-session=graysonbreez23aqsayznm7sw7c&scoid=48119808&campaign-id=Email_GL_%20octnov2016_series& charset =utf-8

Brief Description: Amazon S3 and Amazon Glacier provide developers and IT teams with secure, durable, highly-scalable object storage with no minimum fees or setup costs. In this webcast, we will provide an introduction to each service, dive deep into key features of Amazon S3 and Amazon Glacier, and explore different use cases that these services optimize. Learning Objectives:

- Business value of Amazon S3 and Amazon Glacier
- Leveraging S3 for web applications, media delivery, big data analytics and backup
- Leveraging Amazon Glacier to build cost effective archives
- Understand the life cycle management of AWS's storage services

Who should attend: Developers, Devops Engineers, Engineers and System Administrators.

To Join the Webinar: Please register at the above website.

Event: NSF I-Corps Webinar

When: 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.

Grant Opportunities

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. Please see details on the format requirement for internal submission in the previous Research Newsletter issues ORN-2016-36 or ORN-2016-37 posted on the research website <http://www5.njit.edu/research/>.

National Science Foundation

Grant Program: Advanced Biomanufacturing of Therapeutic Cells (ABTC)

Agency: National Science Foundation NSF 17-502

RFP Website: <https://www.nsf.gov/pubs/2017/nsf17502/nsf17502.htm>

Brief Description: In recent years, somatic cells as therapeutic agents have provided new treatment approaches for a number of pathological conditions that were deemed untreatable, or difficult to treat. Several successful cell therapies using T cells have been demonstrated for cancer and autoimmune diseases, while stem cell therapies have given relief for heart disease and stroke. Hundreds of clinical trials are ongoing to examine efficacy of cell therapies for a variety of other diseases including diabetes, Alzheimer's, Parkinson's, and Crohn's disease. Production of therapeutic cells is currently expensive and, therefore, cost prohibitive for the large number of people who might benefit from these treatments. The overarching goal of this Advanced Biomanufacturing of Therapeutic Cells (ABTC) solicitation is to catalyze well-integrated interdisciplinary research to understand, design, and control cell manufacturing systems and processes that will enable reproducible, cost-effective, and high-quality production of cells with predictable performance for the identified therapeutic function.

Awards: Standard Grants. Anticipated funding amount: \$5,000,000

Letter of Intent: Not Required

Preliminary Proposal Submission Due Date: January 04, 2017

Full Proposal Submission Due Date: April 17, 2017

Contacts:

- Carol Lucas, telephone: (703) 292-4608, email: carlucas@nsf.gov
 - Rajakkannu Mutharasan, telephone: (703) 292-4608, email: rmuthara@nsf.gov
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Grant Program: IUSE / Professional Formation of Engineers: REvolutionizing engineering and computer science Departments (IUSE/PFE: RED)

Agency: National Science Foundation NSF 16-501

RFP Website:

https://www.nsf.gov/pubs/2017/nsf17501/nsf17501.htm?WT.mc_id=USNSF_25&WT.mc_ev=click

Brief Description: In FY 2017, NSF is continuing a program aligned with the Improving Undergraduate STEM Education (IUSE) framework: *REvolutionizing engineering and computer science Departments*. This funding opportunity enables engineering and computer science departments to lead the nation by successfully achieving significant sustainable changes necessary to overcome longstanding issues in their undergraduate programs and educate inclusive communities of engineering and computer science students prepared to solve 21st century challenges.

In 2014, ENG launched an initiative, the *Professional Formation of Engineers* (PFE), to create and support an innovative and inclusive engineering profession for the 21st century. At the same time, in 2014, NSF launched the agency-wide Improving Undergraduate STEM Education (IUSE) framework, which is a comprehensive effort to accelerate improvements in the quality and effectiveness of undergraduate education in all STEM fields. The RED program was first offered in FY 2015 as a PFE initiative aligned with the IUSE framework. Additional programs have been created within the IUSE framework across NSF, such as the IUSE: EHR program within EHR.

Even as demographic and regional socio-economic factors affect engineering and computer science departments in unique ways, there are certain tenets of sustainable change that are common across institutions. For instance, the development and engagement of the entire faculty within a department are paramount to the process, and faculty must be incentivized. Departmental cultural barriers to change and to inclusion of students *and* faculty from different backgrounds must be identified and addressed. Finally, coherent technical and professional threads must be developed and woven across the four years, especially (1) in the core technical courses of the middle two years, (2) in internship opportunities in the private and public sectors, and (3) in research opportunities with faculty. These and other threads aim to ensure that students develop deep knowledge in their discipline more effectively and meaningfully, while at the same time building their capacities for 21st century and "T-shaped" professional skills, including design, leadership, communication, understanding historical and contemporary social contexts, lifelong learning, professional ethical responsibility, creativity, entrepreneurship, and multidisciplinary teamwork. It is expected that, over time, the awardees of this program will create knowledge concerning sustainable change in engineering and computer science education that can be scaled and adopted nationally across a wide variety of academic institutions. The research on departmental change that results from these projects should inform change more broadly across the STEM disciplines.

Note: The RED program is offered in alignment with the NSF-wide undergraduate STEM education initiative, *Improving Undergraduate STEM Education (IUSE)*. More information about IUSE can be found in the Introduction of this solicitation. The IUSE/PFE: RED program will hereafter be referred to as RED.

Prospective PIs are encouraged to consider the IUSE: EHR program for projects that are outside the scope of RED (see https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505082).

Specifically, the Institutional and Community Transformation (ICT) track promotes innovative approaches to using research to catalyze change that addresses challenges across and within institutions (institutional transformation), as well as within and across specific disciplines (community transformation).

Prospective PIs are strongly discouraged from submitting identical or substantially similar proposals to RED and IUSE: EHR.

Awards: Standard Grants. Anticipated funding amount: \$11,900,000

Letter of Intent: December 09, 2016

Full Proposal Submission Due Date: January 18, 2017

Contacts:

- Kamau Bobb, Program Director, Division of Computer and Network Systems, Directorate for Computer & Information Science & Engineering, telephone: (703) 292-4291, email: kbobb@nsf.gov
 - Elliot Douglas, Program Director, Division of Engineering Education and Centers, Directorate for Engineering, telephone: (703) 292-7051, email: edouglas@nsf.gov
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National Institutes of Health

Grant Program: Systems Biology Approaches to Alzheimer's Disease Using Non-mammalian Laboratory Animals (R01)

Agency: National Institutes of Health RFA-AG-17-057

RFP Website: <http://grants.nih.gov/grants/guide/rfa-files/RFA-AG-17-057.html>

Brief Description: Conceptually, a pathway to Alzheimer's disease or related dementias can be envisioned in three steps: proximal causes à neurodegeneration à dementia. Neurodegeneration can encompass anything from synaptic failure to neuronal death, and might originate within the neurons or associated cells such as the diverse types of glia. Discoveries of candidate proximal causes of neurodegeneration and candidate amplifying or protective factors are the primary goals of this FOA. Alzheimer's disease dementia is one outcome of neurodegeneration, and other outcomes of neurodegeneration have different clinical presentations and affect more than neuronal tissues, including amyotrophic lateral sclerosis, Parkinson's disease, Huntington's disease, and Frontotemporal Dementia, among many others. Significant research effort has been focused on proteinopathies (dysregulated protein homeostasis) as a leading mechanism for neurodegeneration, but other events upstream (proximal causes) have been less studied. Several mutations in specific proteins that can be linked to the proteinopathies and account for a portion of heritability of some diseases such as amyloidosis, tauopathy, synucleinopathy, prion disease and aggregation of other specific proteins have been identified. However, it is not yet conclusively established that proteinopathies, per se, are the root cause of most dementias. In addition, there are possible gene x environment interactions that could lead to neurodegeneration and which could be explored using established non-mammalian laboratory animals with the capacity for high-throughput data collection and screening. Because these remain testable hypotheses it is therefore appropriate to consider a search to discover additional proximal causes upstream of neurodegeneration, as well as amplifying and protective factors.

This FOA is intended to support discovery of candidate causes or amplifiers of, or protections against, neurodegeneration, and not studies on mechanisms of neurodegeneration which may or may not be specific to neurons and their associated cells. One approach to generating candidate proximal causes of any biological process, including disease, is systems biology. The use of non-mammalian laboratory organisms often allows for the recapitulation of many cellular and molecular aspects of human conditions, eventually facilitating the study of

molecular mechanisms and testing of interventions in the context of multiple cell types. Furthermore, multiple readouts – both biological and molecular – are available from powerful genetic tools such as reporter constructs and high-throughput technologies. The door is now open to studies using systems biology to generate hypotheses through the discovery of candidate proximal causes of neurodegeneration. Such studies could also address whether causes of cellular degeneration in non-neuronal tissues might also apply to neurodegeneration, and whether causes of neurodegeneration are not shared with other cell types, perhaps implying protective mechanisms in other cell types or selective responsiveness to environmental triggers. Thus, systems biology may also be an important tool to implicate protective factors against established causes of neurodegeneration, when examined at low-to-moderate levels of causal factors (e.g., disrupted proteostasis) within the context of aging.

Awards: Application budget requests should reflect the actual needs for the proposed project. NIA intends to commit \$3.3 million in FY 2017 to fund up to 5 awards.

Letter of Intent: December 18, 2016

Deadline: January 18, 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 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: Common Mechanisms and Interactions Among Neurodegenerative Diseases (R01)

Agency: National Institutes of Health PAS-17-028

RFP Website: <http://grants.nih.gov/grants/guide/pa-files/PAS-17-028.html>

Brief Description: Etiologic and therapeutic research on dementia has focused on either individual disease syndromes (e.g., Alzheimer’s disease, AD; Lewy Body Dementia, LBD, Frontotemporal Dementia, FTD; or Vascular Dementia, VD) or distinct neurodegenerative processes (e.g., beta-amyloid, HPF-Tau, alpha-synuclein, TDP-43, small vessel disease). Aside from descriptive, postmortem neuropathology, different neurodegenerative diseases have generally been investigated in isolation from one another. There are few models for studying whether and how neurodegenerative disease processes relate to one another. At autopsy, many patients with dementia, particularly older individuals, exhibit multiple neuropathologies: in addition to tau tangles and beta-amyloid plaques, vascular changes, Lewy bodies, and TDP-43 inclusions are often present. We know that the likelihood of antemortem dementia increases with co-occurring postmortem neuropathology. However, despite considerable evidence of interactions between different neuropathologies (see below), we do not understand how different neurodegenerative processes interact and relate to one another.

Co-occurring pathology complicates both pathophysiological investigation and treatment development. For instance, therapies to increase beta-amyloid clearance may be less effective if there is coincident VD or LBD. At the same time, commonalities between neurodegenerative diseases may provide clues to pathophysiological mechanisms. Can multiple neuropathologies interact synergistically to increase disease burden and worsen cognitive impairment? Could there be common pathways leading to synapse loss and cell death that might become targets for drug development? If either speculation is the case, what molecular, cellular, or organismic processes are involved?

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

Letter of Intent: Not Required

Deadline: [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.

Grant Program: Rehabilitation Research Career Development Programs (K12)

Agency: National Institutes of Health RFA-HD-17-021

RFP Website: <http://grants.nih.gov/grants/guide/rfa-files/RFA-HD-17-021.html>

Brief Description: The overall goal of the NIH Research Career Development programs is to help ensure that a diverse pool of highly trained scientists is available in appropriate scientific disciplines to address the Nation's biomedical, behavioral, and clinical research needs. More information about Career programs may be found at the [NIH Extramural Training Mechanisms](#) website. This FOA invites applications to coordinate the mentoring and career development of rehabilitation researchers, especially in clinical domains that may include one of the following: psychiatrists, physical/occupational therapy and allied health professionals, clinicians involved in neurological rehabilitation, or bioengineers. Unlike some other NIH K12 programs, this FOA will support a national network rather than a program exclusively located at the applicant institution. The applicant will be responsible for identifying qualified candidates (scholars) and supporting them in appropriate research environments throughout the country.

This FOA encourages applications that promote networking among clinical and academic departments as well as professional organizations in order to attract and nurture a new cadre of rehabilitation researchers. Scholars supported under these programs would be encouraged to seek independent and stable research support through grants from the NIH and other federal agencies and research foundations.

The proposed institutional research career development program may complement other, ongoing research training and career development programs at the applicant institution, but the proposed career development experiences must be distinct from those career development programs currently receiving Federal support.

Awards: Applicants may request up to \$715,000 annual direct costs. Future year amounts will depend on annual appropriations.

Letter of Intent: November 28, 2016

Deadline: December 28, 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: Proof of Concept Development of Early Stage Next Generation Human Brain Imaging (R01)

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

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

Brief Description: The long-term objective of the overall BRAIN initiative is to accelerate technology development and the use of tools for acquiring fundamental insight about how the nervous system functions in health and disease. This FOA aims to support early stage development of entirely new and novel noninvasive human brain imaging technologies and methods that will lead to transformative advances in our understanding of the human brain.

The FOA solicits unusually bold and potentially transformative approaches and supports small scale, proof of concept development of human brain imaging based on exceptionally

innovative, original and/or unconventional concepts. The goal is to accelerate early stage development of promising and entirely new concepts that require some initial stage of development and testing before launching into full scale tool development. Applications submitted in response to this FOA should focus on innovative approaches and proof of principle initial stage development for breakthrough, noninvasive imaging technology to measure human brain processes in ways that are currently unachievable via imaging technologies in live persons. The proposed concepts and approaches are expected to be high-risk, high-impact, and disruptive (c.f. C. Christensen “The Innovator's Dilemma”, 1997;http://en.wikipedia.org/wiki/Disruptive_innovation).

This FOA will support early stage development of novel interdisciplinary research and technology for noninvasive next generation human brain imaging, with the intention that the technologies be capable of being used practically and ethically in healthy humans irrespective of disease state at any point in the life span. To this end, this FOA will support interdisciplinary teams from diverse research domains to conduct research and development activities such as data exchange, prototype development projects, and small-scale studies in mammals or humans to generate preliminary results. The teams should be prepared, by the completion of the award period, to commence fully developing the next-generation brain imaging technology for use in healthy humans within the timeframe of the BRAIN Initiative (“BRAIN 2025: A Scientific Vision,” <http://braininitiative.nih.gov/>).

Awards: Application budgets are limited to \$300,000 in direct costs in any project year.

Letter of Intent: December 20, 2016

Deadline: January 20, 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 this date.

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.

Department of Defense/US Army/DARPA/ONR

Grant Program: DoD USAMRMC FY17 Broad Agency Announcement for Extramural Medical Research

Agency: Department of Defense Dept. of the Army – USAMRAA W81XWH-17-R-BAA1

Website:

<https://www.fbo.gov/index?s=opportunity&mode=form&id=bacdeb99dc1cf27e8dcd920b1fe751ac&tab=core&cvview=0>

Brief Description: The USAMRMC mission is to provide solutions to medical problems of importance to the American Service member at home and abroad, as well as to the general public at large. The scope of this effort and the priorities attached to specific projects are influenced by changes in military and civilian medical science and technology, operational requirements, military threat assessments, and national defense strategies. The extramural research and development programs play a vital role in the fulfillment of the objectives established by the USAMRMC. General information on USAMRMC can be obtained at <http://mrmc.amedd.army.mil/index.cfm>. This FY17 BAA is intended to solicit extramural research and development ideas and is issued under the provisions of the Competition in Contracting Act of 1984 (Public Law 98-369), as implemented in Federal Acquisition Regulation (FAR) 6.102(d)(2) and 35.016 and in DoD Grant and Agreement Regulations (DoDGARS) 22.315. In accordance with FAR 35.016, projects funded under this BAA must be for basic and applied

research to support scientific study and experimentation directed towards advancing the state of the art or increasing knowledge or understanding rather than focusing on development of a specific system or hardware solution. Research and development funded through this BAA are intended and expected to benefit and inform both military and civilian medical practice and knowledge. The selection process is highly competitive and the quantity of meaningful submissions (both pre-proposals/pre-applications and full proposals/applications) received typically exceeds the number of awards that available funding can support. This BAA provides a general description of USAMRMC's research and development programs, including research areas of interest, evaluation and selection criteria, pre-proposal/pre-application and full proposal/application preparation instructions, and general administrative information. Specific submission information and additional administrative requirements can be found in the document titled "General Submission Instructions" available in Grants.gov along with this BAA. **This FY17 BAA is continuously open for a 12-month period, from October 1, 2016 through September 30, 2017, at 11:59 p.m. Eastern Time.** Submission of a pre-proposal/pre-application is required and must be submitted through the electronic Biomedical Research Application Portal (eBRAP) (<https://eBRAP.org/>). Pre-proposals/pre-applications may be submitted at any time throughout the 12-month period. If the USAMRMC is interested in receiving a full proposal/application, the PI will be sent an invitation to submit via eBRAP. A full proposal/application must be submitted through Grants.gov (<http://www.grants.gov/>). Invited full proposals/applications can be submitted under this FY17 BAA through September 30, 2017.

Awards: Various

Deadline: Open until September 30, 2017

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

Department of Energy

Grant Program: Scaling Up the Next Generation of Building Efficiency Packages

Agency: Department of Energy DE-FOA-0001518

Website: <https://eere-exchange.energy.gov/#Foald746d7b5b-0f97-4848-b7d9-ba4f66905af9>

Brief Description: The Commercial Buildings Integration (CBI) program, working in cooperation with the General Services Administration's (GSA) Green Proving Ground program, will invest \$6.5 million in a competitive Funding Opportunity Announcement (FOA). DOE seeks proposals that drive innovation in real building technology demonstrations while also fostering the collaboration of dynamic demonstration teams that include energy organizations (states, local governments or Regional Energy Efficiency Organizations), efficient building hubs (such as Innovation or Incubator hubs), utilities, and building energy modeling professionals.

This FOA builds off of current laboratory and simulation analysis of technology packages by investing in real building demonstrations led by strategically structured teams who will identify and verify multi-system energy efficiency packages (groups of technologies that improve efficiency across two building systems: envelope, lighting/electrical, plug, process, heating, ventilation, cooling, refrigeration, energy management and information, sensors and controls). Projects selected through this funding opportunity will prime the market for the adoption of emerging and underutilized technology packages and create new synergies between building stakeholder groups, and/or, ultimately help utilities develop and release or expand more aggressive and ambitious Energy Efficiency (EE) program offerings. This FOA also supports the critical function of evaluation, measurement and verification (EM&V) by using existing DOE tools and resources to: 1) identify the most impactful multi-system packages, 2) develop the preliminary savings calculations, 3) collect data to verify package performance along with other

market factors in real buildings, and 4) foster more consistent energy efficiency programs across the country.

Informational Webinar: The Informational Webinar mentioned in the FOA will be held on November 2, 2016 at 12:00PM Eastern Standard Time. Please click or copy and paste this link in your browser for registration:

<https://attendee.gotowebinar.com/register/6534736631364875266>

EERE compiled a **Teaming Partner List** to facilitate the formation of new project teams for this FOA. The Teaming Partner List is available below under "Documents".

Awards: Up to \$700,000

Submission Deadline for Concept Papers: November 21, 2016

Submission Deadline for Full Proposal: February 21, 2017

Contact Information: Commercialbuildings@ee.doe.gov.

NASA

Grant Program: ROSES 2016: Solar System Working

Agency: NASA NNH16ZDA001N-SSW

Website:

<https://nspires.nasaprs.com/external/solicitations/summary.do?method=init&solId={BA231B0B-067C-9D42-D770-848B361FC4CA}&path=init>

Brief Description: The Solar System Workings program solicits proposals for innovative scientific research related to understanding the atmospheric, climatological, dynamical, geologic, physical, and chemical processes occurring within the Solar System. This program is open to investigations relevant to surfaces and interiors of planetary bodies, planetary atmospheres, rings, orbital dynamics, and exospheres and magnetospheres. The Solar System Workings program values the potential of interdisciplinary efforts to solve key scientific questions. The program also values research in comparative planetology. Research supported by this call may include data synthesis, laboratory studies that examine physical or chemical properties and processes, studies of sample or analog materials of other Solar System bodies, field studies of terrestrial analogs of planetary environments, or theoretical and numerical modeling of physical or chemical processes. This program seeks to understand processes that occur throughout the Solar System, as well as those specific to individual objects and systems, but inform our understanding of the fundamental processes at work. A nonexhaustive list of areas of research called for in this solicitation follows. For conciseness in this list, the term 'planetary' refers to Solar System objects other than the Sun (ranging in size from small objects, like comets and asteroids, through natural satellites, and up to planets) and structures (such as atmospheres, ionospheres, and ring systems).

Awards: \$9 - \$10M

Proposal Deadline: Step-1 Proposal: November 17, 2016

Contact: hq-ssw@mail.nasa.gov

McKnight Foundation

Grant Program: Technological Innovations in Neuroscience Awards

Agency: The McKnight Endowment Fund for Neuroscience

Website: <https://neuroscience.mcknight.org/the-awards/technology>

Brief Description: these awards support scientists working on new and unusual approaches to understanding brain function. The program seeks **to advance and enlarge the range of technologies available to the neurosciences**. It does not support research based primarily on existing techniques. The Endowment Fund is especially interested in **how technology may be used or adapted to monitor, manipulate, analyze, or model brain function** at any level, from the molecular to the entire organism. Collaborative and cross-disciplinary applications are invited..

Eligibility: Candidates for McKnight Technological Innovations in Neuroscience Awards:

- Must be working at not-for-profit institutions within the United States.
- Must hold tenured or tenure-track positions at their sponsoring institutions.
- Must be developing new techniques or applying techniques to neuroscience in new ways.
- May not be employees of the Howard Hughes Medical Institute or scientists within the intramural program of the National Institutes of Health.
- May not hold another McKnight award that would overlap with the Technology award.

Awards: Established in 1999, the Technological Innovations in Neuroscience Awards provide up to \$100,000 per year for two years. Each year, up to three awards are given. Funds may be used toward a variety of research activities but not the recipient's salary

LOI Deadline: December 5, 2016

Contact: hq-ssw@mail.nasa.gov

NJIT Contact: Eric Blitz at eric.blitz@njit.edu