

NJIT Research Newsletter

Issue: ORN-2016-024

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/>

Recent Awards: Page 1

In the News: Page 3
(Related to research funding)

Webinar Events and Announcements: Page 5

Grant Opportunities: Page 6

Recent Research Grant and Contract Awards

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

PI: Camelia Prodan (PI)

Department: Physics

Grant/Contract Project Title: Engineering New Materials Based on Topological Phonon Edge Modes

Funding Agency: Keck Foundation

Duration: 07/01/16-06/31/19

PI: Mesut Sahin (PI)

Department: Biomedical Engineering

Grant/Contract Project Title: Electrophysiological Assessment of Cerebellar Injury

Funding Agency: NJ Commission of Brain Injury

Duration: 06/01/15-05/31/17

PI: Rajesh Dave (PI)

Department: Chemical, Biological and Pharmaceutical Engineering

Grant/Contract Project Title: Commercializing Pharmaceutical Process Modeling for Continuous Manufacturing

Funding Agency: NSF

Duration: 10/01/15-09/31/16

PI: Kevin Belfield (PI)
Department: College of Science and Liberal Arts
Grant/Contract Project Title: NJIT REAP in Advanced Photonic Materials
Funding Agency: US Department of the Army
Duration: 06/15/16-09/30/16

PI: Bharat Biswal (PI) and Keerthana Deepti Karunakara (Co-PI)
Department: Biomedical Engineering
Grant/Contract Project Title: Understanding cortical reorganization in spinal cord injury using resting state fMRI
Funding Agency: NJ Commission of Spinal Cord Research
Duration: 07/01/15-06/30/17

PI: Andrew Gerrard (PI)
Department: Center for Solar Terrestrial Research
Grant/Contract Project Title: Scientific Studies from a Network of Sustainable, Robotic Observatories Across the Antarctic Ice-shelf: A New Approach to Polar Research
Funding Agency: NSF
Duration: 09/15/15-08/31/20

PI: Iulian Neamtiu (PI)
Department: Computer Science
Grant/Contract Project Title: Collaborative Research: Program Analysis for Smartphone Application Security
Funding Agency: NSF
Duration: 09/01/15-09/30/16

PI: Richard Foulds (PI)
Department: Biomedical Engineering
Grant/Contract Project Title: Translation of an Upper Extremity Exoskeleton to Community Use
Funding Agency: Parent Project for Muscular Dystrophy Research, Inc.
Duration: 07/01/16-06/30/18

PI: Lev Krasnosperov (PI)
Department: Chemistry and Environmental Sciences
Grant/Contract Project Title: Cloud Droplet Characterization instrument for small aerial platforms
Funding Agency: NASA
Duration: 02/22/16-11/12/16

PI: Lev Krasnosperov (PI)
Department: Chemistry and Environmental Sciences
Grant/Contract Project Title: Cloud Droplet Characterization instrument for unmanned aircraft
Funding Agency: NASA
Duration: 04/07/16-04/06/18

PI: Edward Dreizen (PI)

Department: Chemical, Biological and Pharmaceutical Engineering

Grant/Contract Project Title: Reactive materials with burn rate adjusted by initiation method

Funding Agency: US Air Force

Duration: 06/15/16-06/14/19

PI: Simon Garnier (PI)

Department: Biology

Grant/Contract Project Title: No Brainer: Cognitive-like Behaviors in a Unicellular Slime Mold

Funding Agency: NSF

Duration: 07/01/16-06/30/19

PI: Bryan Pfister (PI)

Department: Biomedical Engineering

Grant/Contract Project Title: Repetitive subconcussive injuries will manifest in structural alterations and behavioral deficits

Funding Agency: NJ Commission on Brain Injury

Duration: 05/30/14-05/29/17

In the News...

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

House Appropriations Committee: The House Appropriations Committee passed the [2017 Homeland Security Bill](#). The bill provides \$41.6 million for the DHS University Programs, an increase of 26% over the request level. This would restore the reductions proposed in the Administration's request for the university-based [Centers of Excellence](#) program and provide funding to maintain at least ten such centers. In other action, partisan divisions over gun control legislation continued to stall the Commerce, Justice, and Science Appropriations bill on both sides of the Hill. Discussion has begun to focus on one or more continuing resolutions after October 1. Read More: [Defense Communities](#).

NSF and NIH: The emergence of biomedical "big data" from a vast array of biological, biomedical, behavioral, social, and environmental databases, and clinical studies has the potential to fulfill the promise of precision medicine. However, the ability to transform these data and images into effective tools for visualization, modeling and analysis is a major challenge. The NSF and NIH have jointly issued solicitation [NSF 16-573](#), entitled Quantitative Approaches to Biomedical Big Data. The solicitation aims to bring together new teams of quantitative scientists and biomedical researchers who have not previously collaborated nor published together. The call is intended to go beyond standard mathematical, computational and statistical applications. From the total NSF/NIH funding of \$5 million, ten to twenty awards will be made. Please see more information about NSF 16-573 in the Grant Opportunity Alert section in this Newsletter.

Earth Observations: The Office of Science and Technology Policy has issued a [Request for Information](#) for input into second National Plan for Civil Earth Observations. The first such

national strategy, released in 2013, was mandated by Congress and was intended to be updated every three years. Thirteen federal agencies are involved in earth observations with activities ranging from building and operating satellites to managing aspects of data distribution.

Agricultural needs, hazard response, ecosystem health, land use change, and long term research depend on a coordinated and well integrated federal system. The RFI lists ten specific questions on user needs and ways in which the federal management of earth observation systems could be improved. Responses are requested by July 15. More information on https://www.federalregister.gov/articles/2016/06/15/2016-14186/request-for-information-on-the-development-of-the-2017-national-plan-for-civil-earth-observations?mc_cid=d68179865a&mc_eid=eabb308b9d

Smart Manufacturing Leadership Coalition: The White House has [announced](#) the award of the Smart Manufacturing Innovation Institute to the UCLA led [Smart Manufacturing Leadership Coalition](#), a consortium of over 200 participating organizations from 30 states. This will focus on smart sensors and process controls that will enhance manufacturing efficiency. In making the announcement, the President also laid out plans for five new manufacturing institutes ranging from robotics to biofabrication. With an eventual goal of fifteen such institutes nationwide, some of these competitions are already underway. More information about SMLC is on the website <https://www.smartmanufacturingcoalition.org>

NSF: STILL ON PIRE: NSF's Partnerships in International Research and Education (PIRE), begun in 2005, "will promote cooperation among scientists and engineers from all nations, and will fund international collaborative activities through all areas of research supported by NSF." The [sixth round](#) encourages interdisciplinary proposals. PIRE is "working with counterpart funding agencies to lower barriers to international collaboration for U.S scientists, engineers and students, and to encourage jointly funded, bilateral and multilateral projects." Please see NSF RFP 16-571 on <http://www.nsf.gov/pubs/2016/nsf16571/nsf16571.htm>. This is limited submission opportunity with one submission per institution. Information about NJIT Internal Competition and proposal submission is included in the following Grant Opportunity section in this issue.

Crowding Out R&D: Subsidizing "technology that is ready for commercial deployment" is pretty much the whole point of the Small Business Innovation Research and Technology Transfer (SBIR-STTR) programs, for which Congress sets aside a percentage of federal research budgets. Since FY11, the SBIR program at NSF "has expanded by 5 percent a year, or almost 30 percent overall . . . almost three times as much as the rest of the agency during the same time period," Assistant Director for Engineering Pramod Khargonekar told a [House Research and Technology Subcommittee hearing](#). While NSF supports permanent reauthorization of SBIR-STTR, it opposes a measure passed by the Small Business Committee that would increase program funding by 40 percent over 6 years for SBIR and 33 percent over 6 years for STTR. Such hikes "would come at the expense" of "existing highly meritorious fundamental research."

Department of Labor: Fair Labor Standards Act: On May 17, the Administration released a [final rule](#) updating the salary level salary threshold under which most salaried workers are entitled to overtime compensation. The salary threshold would increase from \$23,660 to \$47,476. For institutions of higher education, the rule would affect many classes of employees, such as post docs, who have not been eligible for overtime pay in the past. Funding agencies will be obligated to increase allowable stipends. During rulemaking, comments from the higher education community have expressed concerns about the capacity of research intuitions to

absorb these costs and the possibility that these will cut into overall research grant funding and increase tuition costs. The final rule will become effective December 1. Read More: [Inside Higher Ed, American Council on Education](#)

Events and Announcements

Event: NSF Lecture: A Complex Systems Science of Human Learning

When: June 30, 2016 10.00 AM-11.00 AM

Website:

http://www.nsf.gov/events/event_summ.jsp?cntn_id=138984&WT.mc_id=USNSF_13&WT.mc_e v=click

Brief Description: Complex systems science offers conceptual frameworks, analytical approaches, and computational tools to study systems of interacting parts that display emergent behavior. While traditionally applied to large-scale technological and social systems, recent data suggest that complexity science has an incredibly powerful role to play in our understanding of and support for human learning. In this talk I will review emerging lines of research using tools from complex network theory to understand the reconfiguration of connectivity patterns in the brain that support the learning of new skills or the acquisition of new knowledge. I will then discuss the drivers of those reconfigurations revealed by an intersection of neuroscience and network control theory. Finally, I will describe the complex structure of bodies of knowledge, and address the question of whether some sets of knowledge are easier to learn than others based on that structure. Together, these efforts not only enhance our understanding of human learning, but also have the potential to guide training approaches and inform our presentation of information to students or trainees to maximize acquisition and retention. I will close with futuristic aspirations and goals in using complex systems science to propel the field of neuroeducation towards measurable societal impact.

BIO: Danielle S. Bassett is an Associate Professor in the Department of Bioengineering at the University of Pennsylvania. She is most well-known for her work blending neural and systems engineering to identify fundamental mechanisms of cognition and disease in human brain networks. She received a B.S. in physics from the Pennsylvania State University and a Ph.D. in physics from the University of Cambridge, UK. Following a postdoctoral position at UC Santa Barbara, she was a Junior Research Fellow at the Sage Center for the Study of the Mind. In 2012, she was named American Psychological Association's 'Rising Star' and given an Alumni Achievement Award from the Schreyer Honors College at Pennsylvania State University. In 2014, she was named an Alfred P. Sloan Research Fellow and received a MacArthur Research Fellowship. In 2015, she received the IEEE EMBS Early Academic Achievement Award and was named an ONR Young Investigator.

Event: IEEE Spectrum: Xilinx Embedded Vision Solutions for Machine Vision Applications

When: June 30, 2016 1.00 PM-2.00 PM

Website:

<https://event.on24.com/eventRegistration/EventLobbyServlet?target=reg20.jsp&referrer=&eventid=1213105&sessionid=1&key=08F103DB67CF2DCAF00D34F1DDB9B482&partnerref=SOL&sourcepage=register>

Brief Description: Embedded Vision is one of the most exciting fields in technology today. Giving machines the ability to see and sense the world around us creates an endless amount of

commercial opportunities. In this Webinar, Xilinx will present the Avnet Smart Vision Development Kit (SVDK) with its flexible use-cases for intelligent vision processing, and a wide support for industry standard machine vision interfaces developed by Sensor to Image. This Webinar will highlight how Xilinx and its partners' rich suite of IP, development tools, and reference designs provide an ecosystem enabling users to quickly and easily address opportunities in the Machine Vision market.

PRESENTER: Aaron Behman , Director, Strategic Marketing for Embedded Vision, Xilinx, Inc.

Event: IEEE Spectrum: Perspectives on 5G: Beamforming, MIMO, and More

When: July 14, 2016 12.00 PM-1.00 PM

Website:

<https://event.on24.com/eventRegistration/EventLobbyServlet?target=reg20.jsp&referrer=&eventid=1215394&sessionid=1&key=B1FAB7F496B3A566B7656BEA1D9033B1&partnerref=SOL&sourcepage=register>

Brief Description: As telecommunications providers ramp up their drives for 5G wireless demonstration projects, we're bombarded with piecemeal news about advances in signal processing, device-centered communications, and evolving technical standards. This series will offer context, giving attendees a yardstick for evaluating the sometimes disconnected individual reports that make headlines throughout the year. 5G cannot be built on increasing high-frequency spectrum alone. To reach data-rate and user-density targets, communications strategies are moving away from the base station and migrating to the edge, creating multiple channels in single frequencies and learning how to home in on a single device in a crowded cityscape. In this session, two innovators will discuss the range of increasingly sophisticated signal processing strategies for expanding spectrum efficiency, moving from basic concepts, to massive MIMO (multiple input/multiple output), mmWave MIMO, compressed channel estimation, and beamforming design.

PRESENTER: Robert W. Heath, Jr., University of Texas at Austin, MIMO Wireless, and Kuma Signals; and Nuria González Prelcic, University of Vigo, Spain.

Grant Opportunity Alerts

Keywords and Areas Included in Grant Opportunity Alerts:

NSF: Joint NSF/NIH Initiative on Quantitative Approaches to Biomedical Big Data (QuBBD); Partnerships for International Research and Education (PIRE)

NIH: Bold New Bioengineering Methods and Approaches for Heart, Lung, Blood and Sleep Disorders and Diseases (R21); Advancing Basic Behavioral and Social Research on Resilience: An Integrative Science Approach (UG3/UH3)

Department of Defense/US Army/DARPA/ONR: Data-Driven Discovery of Models (D3M); Peer Reviewed Medical Research Program: Investigator-Initiated Research Award

Department of Energy: Clean Energy Manufacturing Innovation Institute for Reducing Embodied-energy of Materials and Decreasing Emissions (REMADE) in Manufacturing

NASA: ROSES 2016: Mars Data Analysis

National Endowment for Humanities: Media Projects: Development Grants

Grant Opportunities

National Science Foundation

Grant Program: Joint NSF/NIH Initiative on Quantitative Approaches to Biomedical Big Data (QuBBD)

Agency: National Science Foundation NSF 16-573

RFP Website: <http://www.nsf.gov/pubs/2016/nsf16573/nsf16573.htm>

Brief Description: Recent advances in medical and healthcare technologies are creating a paradigm shift in how medical practitioners and biomedical researchers approach the diagnosis, prevention, and treatment of diseases. New imaging technologies, advances in genetic testing, and innovations in wearable and/or ambient sensors are allowing researchers to predict health outcomes and develop personalized treatments or interventions. Coupled with the rapid growth in computing and infrastructure, researchers now have the ability to collect, store, and analyze vast amounts of health- and disease-related data from biological, biomedical, behavioral, social, environmental, and clinical studies. The explosion in the availability of biomedical big data from disparate sources, and the complex data structures including images, networks, and graphs, pose significant challenges in terms of visualization, modeling, and analysis.

While there have been some encouraging developments related to foundational mathematical, statistical, and computational approaches for big data challenges over the past decade, there have been relatively few opportunities for collaboration on challenges related to biomedical data science. The National Science Foundation (NSF) and the National Institutes of Health (NIH) recognize that fundamental questions in basic, clinical, and translational research could benefit greatly from multidisciplinary approaches that involve experts in quantitative disciplines such as mathematics, statistics, and computer science.

The Quantitative Approaches to Biomedical Big Data Program is designed to support research that addresses important application areas at the intersection of the biomedical and data sciences by encouraging inter- and multi-disciplinary collaborations that focus on innovative and transformative approaches to address these challenges.

Awards: Standard grants. **Anticipated Funding Amount:** \$5,000,000 per year

Letter of Intent: Not required.

Full Proposal Submission Due Date: September 28, 2016

Contacts:

- Nandini Kannan, Program Director, MPS/DMS, NSF, telephone: (703) 292-8104, email: nakannan@nsf.gov
- Vinay Pai, Program Director, NIH/NIBIB, NIH, telephone: (301) 451-4781, email: BD2K_QuBBD@mail.nih.gov

Grant Program: Partnerships for International Research and Education (PIRE)

Agency: National Science Foundation NSF 16-571

RFP Website: <http://www.nsf.gov/pubs/2016/nsf16571/nsf16571.htm>

Brief Description: Partnerships for International Research and Education (PIRE) is an NSF-wide program that supports international activities across all NSF-supported disciplines. The primary goal of PIRE is to support high quality projects in which advances in research and education could not occur without international collaboration. PIRE seeks to catalyze a higher level of international engagement in the U.S. science and engineering community. International partnerships are essential to addressing critical science and engineering problems. In the global

context, U.S. researchers and educators must be able to operate effectively in teams with partners from different national environments and cultural backgrounds. PIRE promotes excellence in science and engineering through international collaboration and facilitates development of a diverse, globally-engaged, U.S. science and engineering workforce.

This PIRE competition will be open to all areas of science and engineering research which are supported by the NSF.

Awards: Standard grants. **Anticipated Funding Amount:** \$8,000,000 to \$12,000,000 annually, for all new awards, pending the availability of funds

Letter of Intent: Not Required.

Preliminary Proposals: Submission of Preliminary Proposals is required. Please see the full text of this solicitation for further information. Deadline: September 14, 2016

Full Proposal Submission Due Date: April 24, 2017

Limit on Number of Proposals per Organization: 1

A single organization may submit one preliminary proposal as the lead institution. Full proposals will be accepted by invitation only. There is no limit on the number of proposals in which an institution can participate as a partner.

Limit on Number of Proposals per PI or Co-PI: There are no restrictions or limits.

Contacts:

- Cassandra M. Dudka, telephone: (703)292-7250, email: PIRE-info@nsf.gov
- Cassidy Burke, telephone: (703)292-2464, email: PIRE-info@nsf.gov

NJIT Internal Competition:

Due to the limit of only one submission per institution, an internal competition has been set up to select NJIT proposal to PIER RFP opportunity. All internal preliminary proposals should be submitted to respective college deans by August 1, 2016. Only one preliminary proposal per college with the recommendation of the college dean must be forwarded to the Office of Research by August 8 for institutional review. Selected preliminary proposal will be announced by August 12 for submission to NSF by the due date of September 14, 2016. NJIT internal preliminary proposal should consist of the following elements:

- **Cover Sheet:** Check the box indicating that this is a preliminary proposal. Provide an informative title that begins with "PIRE:". The proposed PIRE Project Director must be shown as the Principal Investigator.
- **Project Summary:** (1 page maximum) Describe the concept of the proposed PIRE project, including why the international partnership is critical to the project success. Separately address the intellectual merit and broader impacts of the project. The summary should be informative to those working in the same or related field(s), and understandable to a scientifically or technically literate reader.
- **Project Description (6 page maximum):** The Project Description should take the form of a concept paper that clearly outlines the research challenges being addressed or breakthroughs being sought in the proposed PIRE project. The proposed approaches must be innovative and must show clear benefit from international collaboration (for example, expertise, facilities, resources, access to phenomena) and active engagement of US students and junior researchers. Include the following elements:
 - **Administrative Summary** (1 page maximum) should include:
 - title of the project
 - principal investigator
 - length of study (maximum 5 years)
 - estimated total budget (does not need to be itemized)
 - lead institution

list of partner institutions and key researchers

If the proposal is to be considered for Additional Funding Opportunity(ies) as described in Section II.D., **explicitly name the funding partner agency(ies)**.

- **Research Summary** (3 page maximum): Summarize the main ideas and essence of the proposed research. Describe the issue/topic the proposed research is trying to address, the overall goal, approaches, expected outcomes, and the synergy that each participant brings to the project.
- **Education Summary** (2 page maximum): Describe the goals of the proposed education activities, and how the integration of research and education will advance the proposed PIRE project in a way that other funding mechanisms cannot. A justification for education programs and activities should be included and described in the context of current knowledge of teaching and learning.
- **References Cited:** Per NSF Grant Proposal Guide instructions.
- **Biographical Sketches:** Required for PIRE Project Director (PI), Co-PIs, and key domestic and international partners. Use the required NSF Biographical Sketch format as specified in the NSF Grant Proposal Guide ([GPG Chapter II.C.2.f](#)).

Any question on internal preliminary proposal competition should be directed to Atam Dhawan, Vice Provost for Research (dhawan@njit.edu)

National Institutes of Health

Grant Program: Bold New Bioengineering Methods and Approaches for Heart, Lung, Blood and Sleep Disorders and Diseases (R21)

Agency: National Institutes of Health RFA-HL-17-015

RFP Website: <http://grants.nih.gov/grants/guide/rfa-files/RFA-HL-17-015.html>

Brief Description: This program is meant to foster discovery- and design-driven bioengineering research ideas that are important across the Institute and that are critical for future hypothesis-generating projects. It is noteworthy that this program emphasizes development, not so much efficacy, of first-generation prototypes. The NHLBI is interested in the development of new ideas for diagnostics, therapeutics, surgical technologies, computational modeling tools, smart biomaterials for self-adjusting implants, and nanotechnologies, as applied to the cardiovascular, pulmonary, non-malignant hematologic, and sleep health mission areas of the Institute.

Topic areas include, but are not limited to:

- Development of: noninvasive and nondestructive 3D imaging methods, including new molecular probes, for *in vivo* real-time monitoring, and techniques for metabolic imaging of disease progression
- Image processing tools and methodology for big data, precision medicine, systems biology and -omics, especially for guiding interventions and patient screening
- Approaches to improve cardiovascular, lung and blood repair and regeneration
- Artificial lungs as a bridge to transplant or for treatment of lung failure
- New platforms for clinical decision support, electronic health records, and mobile health monitoring devices
- New additive solutions and cell/tissue/organ processing and preservation technologies
- New storage bags and/or new processes to enhance blood cell function and survival after storage and transfusion

- New design principles that affect organ-specific transplantation biology and regenerative medicine
- Development of tools/algorithms for objective evaluation of sleep health and disorders
- New tools, methods and technologies that facilitate therapeutic advances and behavioral changes to address problems in energy balance, weight control and obesity
- Tools to better understand biological host sex differences
- Development of artificial oxygen (O₂) carrier to substitute for banked blood in settings where stored blood is unavailable or undesirable
- Mathematical modeling, and computational simulation techniques to understand mechanisms of HLBS systems, including gene, protein, and metabolic regulatory networks
- Innovative ways to measure tissue microoxygenation
- Nanotechnologies that significantly improve diagnostic and medical devices.

Awards: Direct costs are limited to \$275,000 over a two-year period, with no more than \$150,000 in direct costs allowed in any single year.

Letter of Intent: 30 days before the application due date

Deadline: October 13, 2016; January 10, 2017; May 10, 2017; October 13, 2017; January 10, 2018; May 10, 2018; October 10, 2018; January 10, 2019; May 10, 2019, 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: Advancing Basic Behavioral and Social Research on Resilience: An Integrative Science Approach (UG3/UH3)

Agency: National Institutes of Health PAR-16-326

RFP Website: <http://grants.nih.gov/grants/guide/pa-files/PAR-16-326.html>

Brief Description: The term “resilience” has broad associations and conveys different meanings in different contexts. It has been used to describe the absence of adverse consequences after exposure to a stressor as well as processes of recovery and adaptation that may involve learning or post-traumatic growth. Life challenges such as natural disasters, cumulative social and financial pressures, and serious illnesses are unavoidable, and have psychological and health consequences. However some individuals or social groups are able to maintain high levels of functioning and adaptation in the face of such challenges. Insights into the processes and mechanisms that maintain function, support recovery, or enhance function in response to severe challenges may help identify potential targets for behavioral or biomedical interventions to promote lifelong health.

Currently behavioral and social science research on resilience lacks a common framework, taxonomy, or approach that extends across multiple levels of analysis (e.g., genetic/epigenetic, neurobiological, physiological, psychological, behavioral, social, environmental). In addition current research does not clearly articulate the various predisposing factors, classes of adverse exposures, dynamic processes of adaptation, and potential environmental moderators of those processes. This initiative seeks to address these gaps.

The focus of studies to be funded under this FOA is on the characterization of the patterns of response to a challenge across multiple, interacting levels of analysis and the identification of the factors associated with physical, psychological or social resilience in individuals or social communities. Critical elements of all proposals include a well characterized

precondition and an assessment of the dynamic changes over time on the relevant outcomes. Selection of a challenge should be based on feasibility of assessment and significance to human health. The approach must have relevance to the mission of one of the participating NIH Institutes, Centers or Offices, including assessments of health-relevant processes and outcomes. Applications may address dynamic responses over time to either acute (e.g. crime victimization, natural disaster, disease diagnosis, onset of disability, bereavement, job loss) and/or chronic (e.g. poverty, ongoing abuse, social isolation, long-term illness or disability) challenges or exposures. Optimization of quantitative outcome variables is required to evaluate the response to the stressor, so that enough variance is obtained to distinguish non-responders, normal responders, and exceptionally robust responders. Projects may include aims examining the “steeling” effects of a challenge, also described as stress inoculation, and how this may impact (ameliorate) risk for future problems, potential for thriving, and the ability to handle stress in the future.

Applications are encouraged that advance our ability to measure the change process, offer novel insights into pre-disposing/pre-existing factors and identify the predictive potential of these factors for distinct health-related or disease outcomes.

Importantly, assessments of dynamic processes of adaptation to challenge should focus on measuring resilience as an integrative response, rather than being specific to a given level of analysis (e.g. behavioral or physiological). Important parameters might include the identity, duration and magnitude of the stressors, as well as measures of various response parameters, including response magnitude, frequency and duration, the extent and time to recovery and refractory times. The proposed outcome measures should have the potential for predictors of future health outcomes relevant to the missions of the sponsoring NIH Institutes, Centers and Offices.

Awards: UG3 phase support is limited to \$250,000 per year with the exception of studies incorporating well-justified pilot studies, in which case there is no budget limit. The budget for the UH3 phase is not limited but needs to reflect the actual needs of the proposed project.

Letter of Intent: November 1, 2016

Deadline: December 1, 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: Data-Driven Discovery of Models (D3M)

Agency: Department of Defense DARPA-BAA-16-43

Website:

https://www.fbo.gov/index?s=opportunity&mode=form&id=a93bd7c9187c88966b3ba078364a5970&tab=core&_cvview=0

Brief Description: DARPA is soliciting innovative research proposals in the area of automated model discovery systems that create empirical models of real, complex processes from data. Proposed research should investigate innovative approaches that enable revolutionary advances in science, devices, or systems. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice.

Understanding the complex and increasingly data-intensive world around us relies on the construction of robust empirical models, i.e., representations of real, complex systems that enable decision makers to predict behaviors and answer “what-if” questions. Empirical models

play key roles in military tactical and strategic planning. They allow us to optimize logistics in the presence of stochastic elements such as weather and traffic, help us improve job placement within the military, and enable tracking and prediction of enemy troop movements and tactics during conflicts.

Data-driven models also lie at the heart of empirical science (e.g., quantitative physics, material science, chemistry, biology/medicine, etc.). Basic research often aims to develop these models, which engineers and scientists can then use to develop new technologies (e.g., to fabricate new semiconductors, or develop new sensors and better weapon systems). Today, construction of complex empirical models is largely a manual process requiring access to data scientists who can:

- a. collaborate with subject matter experts to define a suitable modeling problem,
- b. curate, select and annotate appropriate data,
- c. transform, cleanse and structure data,
- d. extract features from data into a form that can be modeled,
- e. model the data, and
- f. visualize and explain the modeled outcomes.

Awards: Multiple awards are anticipated.

Deadline: Abstract Due: June 24, 2016, 12:00 noon (ET)

Proposal Due Date: August 12, 2016, 12:00 noon (ET)

Agency contact: D3M@darpa.mil Wade Shen, Program Manager, DARPA/I2O

Grant Program: Peer Reviewed Medical Research Program: Investigator-Initiated Research Award

Agency: Department of Defense; Defense Health Program: Congressionally Directed Medical Research Programs W81XWH-16-PRMRP-IIRA

RFP Website: http://cdmrp.army.mil/funding/pa/16prmrpiira_pa.pdf

Brief Description: Applications to the Fiscal Year 2016 (FY16) Peer Reviewed Medical Research Program (PRMRP) are being solicited for the Defense Health Agency, Research, Development, and Acquisition (DHA RDA) Directorate, by the U.S. Army Medical Research Acquisition Activity (USAMRAA). As directed by the Office of the Assistant Secretary of Defense for Health Affairs (OASD[HA]), the DHA RDA Directorate manages the Defense Health Program (DHP) Research, Development, Test, and Evaluation (RDT&E) appropriation. The managing agent for this Program Announcement/Funding Opportunity is the Congressionally Directed Medical Research Programs (CDMRP). The PRMRP was initiated in 1999 to provide support for military health-related research of exceptional scientific merit. Appropriations for the PRMRP from FY99 through FY15 totaled \$1.092 billion. The FY16 appropriation is \$278.7 million (M).

The vision of the FY16 PRMRP is to improve the health and well-being of all military Service members, Veterans, and beneficiaries. The PRMRP challenges the scientific and clinical communities to address at least one of the FY16 Topic Areas with original ideas that foster new directions along the entire spectrum of research and clinical care. The program seeks applications in laboratory, clinical, behavioral, epidemiologic, and other areas of research to advance knowledge in disease etiology, improve prevention, detection, diagnosis, treatment, and quality of life for those affected by a relevant disease or condition, and to develop and validate clinical care or public health guidelines.

Awards: The anticipated direct costs budgeted for the entire period of performance will not exceed **\$1.2M**. Indirect costs are to be budgeted in accordance with the organization's negotiated rate. No budget will be approved by the Government exceeding **\$1.2M** direct costs or using an indirect rate exceeding the organization's negotiated rate.

Deadline: Pre-Application Submission Deadline: 5:00 p.m. Eastern time (ET), June 23, 2016

- **Invitation to Submit an Application:** August 2016
 - **Application Submission Deadline:** 11:59 p.m. ET, October 19, 2016
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Department of Energy

Grant Program: Clean Energy Manufacturing Innovation Institute for Reducing Embodied-energy of Materials and Decreasing Emissions (REMADE) in Manufacturing

Agency: Department of Energy DE-FOA-0001594RFP

Website: <https://eere-exchange.energy.gov/default.aspx#FoaIda1ab41d9-cb57-4413-a9da-fbfb23bc5c73>

Brief Description: The Office of Energy Efficiency and Renewable Energy (EERE), within the U.S. Department of Energy (DOE), invests in cutting-edge research, development, and demonstration (RD&D) activities focused on sustainable transportation, renewable power, and energy efficiency. In 2013, EERE launched its Clean Energy Manufacturing Initiative (CEMI) with the goal of significantly increasing U.S. manufacturing competitiveness in the production of clean energy products and in domestic manufacturing across the board by increasing industrial energy productivity. EERE's Advanced Manufacturing Office (AMO) plays a key role in executing the mission for CEMI by supporting research and development projects, shared research facilities and technical consortia, and technical assistance programs. AMO establishes Manufacturing Innovation Institutes in the Administration's National Network for Manufacturing Innovation (NNMI) as shared research, development, and demonstration facilities to overcome cross-cutting challenges related to the manufacturing of clean energy and energy efficiency products, in addition to challenges associated with improving the energy efficiency of the manufacturing sector across the board. This FOA supports the establishment of a Clean Energy Manufacturing Innovation Institute for Reducing Embodied-energy And Decreasing Emissions (REMADE) in Materials Manufacturing. This Institute will enable the development and widespread deployment of key industrial platform technologies that will dramatically reduce life-cycle energy consumption and carbon emissions associated with industrial-scale materials production and processing through the development of technologies for reuse, recycling, and remanufacturing of materials. Solving this enormous and currently unmet challenge could significantly reduce U.S. primary energy usage and greenhouse gas emissions in the manufacturing sector, which represents a particularly challenging sector to decarbonize, and improve U.S. manufacturing competitiveness in the process. The full Funding Opportunity Announcement is posted on the EERE Exchange website at <https://eere-exchange.energy.gov>. Applications must be submitted through the EERE Exchange website to be considered for award. The applicant must first register and create an account on the EERE Exchange website. The Users' guide for applying to Department of Energy, Energy Efficiency and Renewable Energy's Funding Opportunity Announcements through the Exchange website can be found at <https://eere-exchange.energy.gov/Manuals.aspx>. Information on where to submit questions regarding the content of the announcement and where to submit questions regarding submission of applications is found in the full FOA posted on the EERE Exchange website. The Exchange system is currently designed to enforce hard deadlines for Full Application submissions. The APPLY and SUBMIT buttons automatically disable at the defined submission deadlines. The intention of this design is to consistently enforce a standard deadline for all applicants. Applicants that experience issues with submissions PRIOR to the FOA Deadline: In the event that an Applicant experiences technical difficulties with a submission, the Applicant should contact the Exchange helpdesk for assistance (EERE-ExchangeSupport@hq.doe.gov).

Awards: Total available funding: \$70,000,000

Deadline:

Informational Webinar: 6/29/2016 3:00pm ET

Submission Deadline for Concept Papers: 7/28/2016 5:00pm ET

Submission Deadline for Full Applications: 9/28/2016 5:00pm ET

Expected Submission Deadline for Replies to Reviewer Comments: 10/25/2016 5:00pm ET

Expected Date for EERE Selection Notifications: December 2016

Agency contact: To apply to this FOA, applicants must register with and submit application materials through EERE Exchange at <https://eere-Exchange.energy.gov>, EERE's online application portal.

NASA

Grant Program: ROSES 2016: Mars Data Analysis Program

Agency: NASA NNH16ZDA001N-MDAP

RFP Website:

<https://nspires.nasaprs.com/external/solicitations/summary.do?method=init&solId={2CAAAB A3-87C9-3C8E-28D8-33E4BC37ADEC}&path=init>

Brief Description: The objective of the Mars Data Analysis Program (MDAP) is to enhance the scientific return from missions to Mars conducted by NASA and other space agencies. These include, but are not limited to, the following missions: Mars Pathfinder (MPF), Mars Global Surveyor (MGS), Mars Odyssey (MO), Mars Exploration Rovers (MERs), Mars Express (MEX), Mars Reconnaissance Orbiter (MRO), Phoenix (PHX), Mars Science Laboratory (MSL), and Mars Atmosphere and Volatile Evolution (MAVEN). Any proposal may incorporate the investigation of data from more than one mission. Additional information about these missions, as well as references containing preliminary science results, can be found on the Mars Exploration Program (MEP) homepage at: <http://mars.jpl.nasa.gov/>.

MDAP broadens scientific participation in the analysis of mission data sets and funds high-priority areas of research that support planning for future Mars missions. Investigations that use data derived from other sources (e.g., ground-based radar, Hubble) will also be considered. MDAP supports scientific investigations of Mars using publicly available (released) data.

Investigations submitted to this program must demonstrate how the research to be undertaken will directly improve our understanding of open science questions at Mars relevant to current hypotheses. Tasks responsive to this call include 1) data analysis tasks, 2) nondata-analysis tasks that are necessary to analyze or interpret the data, and 3) nondata-analysis tasks that significantly enhance the use or facilitate the interpretation of mission data. These tasks may incorporate theory, modeling, laboratory studies, correlative analyses, and/or other research. Proposals that include nondata-analysis tasks to enhance the use or facilitate the interpretation of mission data must incorporate the results of such tasks in the analysis or interpretation of mission data to be responsive to this call. MDAP does not support field studies or the acquisition of new astronomical observations.

Award: Available funds: \$3,000,000

Proposal Deadline: MDAP Step 1 Proposal Due: August 26, 2016

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