

# NJIT Research Newsletter

Issue: ORN-2016-035

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**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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(Related to research funding)

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**Fall 2016 Office of Research Open House**  
**Ballroom A, Campus Center**  
**September 26, 2016; 12.00 PM to 4.00 PM**  
(Light lunch at 12.00 PM)

We are pleased to announce the “Fall 2016 Research Open House” hosted by the Office of Research with participation from offices of Accounts Payable, Budget Purchasing, Treasury, and Human Resources. We will have 9 information stations (tables) with respective staff representatives on research grants related processes. During the open house, faculty and staff members can stop by a specific information station, ask a question to the staff on the table, and move to another table to ask another question. The objective is to provide information about recent changes and answer questions of research faculty and staff with a conversation that will help strengthening support to the NJIT research community. The agenda is as follows.

12:00 PM – 12:40 PM: Greetings, Networking and Lunch

12:40 PM – 12:50 PM: Welcome and Opening Remarks by Provost Fadi Deek

12:50 PM – 1:10 PM: Introductions and Summary of Recent Changes in Research Related Processes by Vice Provost for Research Atam Dhawan

1:10 PM – 3:50 PM: Faculty and Staff Interactions at Information Stations

3:50 PM – 3:55 PM: Closing Remarks

**Research Open House 2016**  
**Information Stations and Staff Representatives**  
(Please visit anti-clockwise from Information Station 1 to 9)

- 1. Ambassadors-Proposal Submission Processes**
- 2. Implementation of Streamlyne Grant Management Software**
- 3. Research Compliance**
- 4. Subcontracts, Consulting, Legal Agreements and IP**
- 5. Personnel Requisitions & Personnel Action Forms**
- 6. Fair Labor Standard Act**

7. Purchase Requisitions, Travel Reimbursement and Vendor Payment:
  8. Post-Award, Budget Management, Federal Uniform Guidance, Financial Reporting and Grants Accounting
  9. URI Opportunities/grants for Undergraduate Students
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**NJIT Panel Discussion Event**  
**NSF Faculty Early Career Development Program (CAREER) Award**  
**October 10, 2016; 2.00 PM – 3.30 PM**  
**112 Eberhardt Hall**

**Faculty Panel**

**Tara Alvarez**, Professor, Biomedical Engineering

**Andrei Sirenko**, Professor, Physics

**Alexei Khalizov**, Assistant Professor, Chemistry and Environmental Sciences

**Casey Diekman**, Assistant Professor, Mathematical Sciences

**Moderator: Atam Dhawan**, Vice Provost for Research

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

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

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**Grant Opportunity Alerts**

Keywords and Areas Included in Grant Opportunity Alerts

**NJIT:** Undergraduate Research and Innovation (URI) Student Seed Grants

**NSF:** Earth Sciences: Instrumentation and Facilities (EAR/IF); Smart and Autonomous Systems (S&AS); Collaborative Research in Computational Neuroscience (CRCNS); NSF/Intel Partnership on Computer Assisted Programming for Heterogeneous Architectures (CAPA); Scalable Parallelism in the Extreme (SPX); Scalable Nano-manufacturing for Integrated Systems

**NIH:** BRAIN Initiative: Standards to Define Experiments Related to the BRAIN Initiative (R24); BRAIN Initiative: Data Archives for the BRAIN Initiative (R24); BRAIN Initiative: Integration and Analysis of BRAIN Initiative Data (R24); BRAIN Initiative: New Concepts and Early-Stage Research for Large-Scale Recording and Modulation in the Nervous System (R21); NLM Express

Research Grants in Biomedical Informatics (R01); NLM Express Research Grants in Biomedical Informatics (R01)

**Department of Defense/US Army/DARPA/ONR:** Reconfigurable Imaging (ReImagine)

**Department of Energy:** Request For Information On Potential Technical Focus Areas For Advanced Manufacturing - Related Traineeships

**NASA:** Research Opportunities for Post-Doctoral Fellowships in Space Biology to Study the Microbiome of the ISS as a Built Environment

**McKnight Endowment Fund for Neuroscience:** McKnight Scholar Awards

**Blavatnik National Awards**

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### **Recent Research Grant and Contract Awards**

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

**PI:** Dale Gary (PI) and Bin Chen (Co-PI)

**Department:** Center for Solar Terrestrial Research

**Grant/Contract Project Title:** Dedicated Radio Imaging and Magnetic Field Measurements of the Sun

**Funding Agency:** NSF

**Duration:** 09/15/16-09/30/19

**PI:** Treena Arinzeh (PI); Boris Khusid (Co-PI) and Michael Jaffe (Co-PI)

**Department:** Biomedical Engineering and Chemical, Biological and Pharmaceutical Engineering

**Grant/Contract Project Title:** Exploiting the Bifunctional Properties of Zinc Oxide as a Smart Biomimetic Material

**Funding Agency:** NSF

**Duration:** 09/15/16-08/31/19

**PI:** Chase Wu (PI)

**Department:** Computer Science

**Grant/Contract Project Title:** Robust Network Fusion Algorithms for Detection of Radiation Sources

**Funding Agency:** DOE

**Duration:** 09/11/15-02/28/17

**PI:** Treena Arinzeh (PI)

**Department:** Biomedical Engineering

**Grant/Contract Project Title:** Stem Cell Bioconstructs for Treating Osteoarthritis

**Funding Agency:** Christopher L. Moseley Foundation

**Duration:** 09/01/16-11/30/17

**PI:** Rongfang Liu (PI)

**Department:** Civil and Environmental Engineering

**Grant/Contract Project Title:** Improve Congestion Performance Measures via Conflating Private and Public Information Sources

**Funding Agency:** US DOT  
**Duration:** 08/03/15-11/02/16

**PI:** Gale Spak (PI)  
**Department:** CPE  
**Grant/Contract Project Title:** Transportation Logistics and Distribution Talent Network  
**Funding Agency:** NJ DOL  
**Duration:** 01/01/16-12/31/16

**PI:** Richard Foulds (PI), Sergei Adamovich (Co-PI), Lu Lu (Co-PI), Taro Narihara (Co-PI), Cong Wang (Co-PI)  
**Department:** Biomedical Engineering, Mechanical and Industrial Engineering, School of Architecture, Electrical and Computer Engineering  
**Grant/Contract Project Title:** MRI - Development of an Open Architecture and Scalable Exoskeleton for Research on the Restoration of Ambulation of Persons with Disabilities  
**Funding Agency:** NSF  
**Duration:** 10/01/16-09/30/18

**PI:** Monique Paden-Hutchinson (PI)  
**Department:** CPCP  
**Grant/Contract Project Title:** Upward Bound  
**Funding Agency:** DOE  
**Duration:** 09/01/12-08/31/17

**PI:** Xiaobo Li (PI)  
**Department:** Biomedical Engineering  
**Grant/Contract Project Title:** Neuroanatomical markers of persistence versus remission of ADHD  
**Funding Agency:** NIH  
**Duration:** 09/26/16-08/31/18

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### **In the News...**

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

**NSF:** For the past ten years, the [Emerging Frontiers in Research and Innovation](https://www.nsf.gov/eng/efma/efri.jsp) (EFRI) program (<https://www.nsf.gov/eng/efma/efri.jsp>) has solicited and funded transformative engineering research ranging from quantum communications to flexible bioelectronics systems. The NSF establishes new EFRI topics through input from the engineering community that comes from workshops, advisory committees, and professional societies. Now the NSF has issued a [Dear Colleague Letter](#) requesting input for the next round of awards. The request seeks to identify emerging areas of potentially transformative research and innovation that go beyond incremental advances. The request suggests that interdisciplinary research will lead to the most transformative ideas. Responses are due October 31. More information on [http://www.nsf.gov/pubs/2016/nsf16138/nsf16138.jsp?WT.mc\\_id=USNSF\\_25&WT.mc\\_ev=click](http://www.nsf.gov/pubs/2016/nsf16138/nsf16138.jsp?WT.mc_id=USNSF_25&WT.mc_ev=click)

**NIH:** The NIH [National Human Genome Research Institute](#) (NHGRI) has issued a [solicitation](#) for

the establishment of academic Centers for Excellence in Genomic Science. With the successful mapping and sequencing of the human genome, attention has turned towards methods to exploit the vast amount of biological information in complete genomic DNA sequences. The [Centers of Excellence in Genomic Science](#) were established in 2000 to focus interdisciplinary teams on specific genomic biomedical problems. As an RM 1 grant, it is recognized that such centers are complex and take on substantial risk, but has the promise of substantially advancing the development large-scale genomics research projects. Currently there are six active centers. NHGRI is able to support up to ten such centers at any one time, and envisions making up to two new awards per year. Each center will be supported from five to ten years in duration with about \$1.75 million per year. Submissions will be open April 23, 2017 with optional letters of intent by April 11, 2017. More information on <http://grants.nih.gov/grants/guide/pa-files/PAR-16-436.html>

**Presidential Memorandum -- Climate Change and National Security:** The White House released a [Presidential Memorandum on Climate Change and National Security](#) directing Federal agencies to fully consider climate change impacts in the development of national security policy and doctrine. The memorandum was accompanied by a report from the [National Intelligence Council](#) illustrating pathways by which climate change could impact national security.

Within 90 days of the date of this memorandum, the Working Group shall, by consensus, develop an Action Plan, which shall identify specific steps that are required to perform the Working Group's functions. The Action Plan shall also include specific objectives, milestones, timelines, and identification of agencies responsible for completion of all actions described therein. The Action Plan shall include recommendations to inform the development of agency implementation plans, as described in section 5 of this memorandum. The Action Plan shall be submitted to the Assistant to the President for National Security Affairs and the Assistant to the President for Science and Technology. Sec. 5. Federal Agency Implementation Plan. Within 150 days of the date of this memorandum, the agencies listed in subsection 4(b) of this memorandum shall each develop an appropriate implementation plan supporting the policy of this memorandum. Such implementation plans may be classified, as required, to meet specific agency requirements

Signed by 375 members of the National Academy of Sciences, an [open letter](#) (<http://responsiblescientists.org/>) was released this week expressing concern over climate change. The signatories include 30 Nobel prize winners and well known figures such as Stephen Hawking. Using terms that have resonated during this election season, the letter states that *"...Human-caused climate change is not a belief, a hoax, or a conspiracy. It is a physical reality..."*

**Antimicrobial Resistance:** Antimicrobial resistance occurs naturally over time, usually through genetic changes. However, the misuse and overuse of antimicrobials is accelerating this process. In many places, antibiotics are overused and misused in people and animals, and often given without professional oversight. Examples of misuse include when they are taken by people with viral infections like colds and flu, and when they are given as growth promoters in animals and fish. In a historic move, Secretary General Ban Ki-moon called upon 193 members of the [United Nations](#) to unify in combatting the growth of antibiotic resistance and implement a set of recommendations from the [World Health Organization](#). The members of the UN declared support for a proclamation to undertake actions that would stem the rise of drug resistant infections which are believed to account for 700,000 deaths per year and could increase to ten million by 2050. These actions would include increasing public awareness, and controlling the use and sales of antimicrobial medicine for humans and animals. In addition, because of the lack

of market incentives for investment in research and development of new and affordable medicines, they called for special efforts to promote innovation.

Anticipating the UN actions, thirteen international leading pharmaceutical company groups released a [comprehensive roadmap](#) for combatting antibiotic resistance through voluntary actions. Among the actions, the companies will review supply chains and discharge, increased provider and patient education, and taking action to identify and limit substandard and counterfeit drugs. More information on <http://www.who.int/mediacentre/factsheets/fs194/en/>

**Smart and Connected Communities:** Five National Science Foundation directorates - Computer & Information Science & Engineering; Education & Human Resources; Engineering; Geosciences; and Social, Behavioral & Economic Sciences - have joined in a [Smart & Connected Communities \(S&CC\) solicitation](#). It seeks "strongly interdisciplinary, integrative research and research capacity-building activities that will improve understanding of smart and connected communities and lead to discoveries that enable sustainable change to enhance community functioning." More information on [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=505364](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505364)

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## **Webinar and Events**

**Event: What is NSF SBIR and Am I A Good Fit?**

**When: September 30, 2016 12.00 PM – 1.00 PM**

**Website:**

[http://www.nsf.gov/events/event\\_summ.jsp?cntn\\_id=189821&WT.mc\\_id=USNSF\\_13&WT.mc\\_e v=click](http://www.nsf.gov/events/event_summ.jsp?cntn_id=189821&WT.mc_id=USNSF_13&WT.mc_e v=click)

**Brief Description:** Join this webinar to learn more about the Small Business Innovation Research / Small Business Technology Transfer (SBIR/STTR) program and how to secure seed funding for your startup. SBIR Program Director Peter Atherton will walk you through the process and answer questions. Prior to the webinar, feel free to browse our [YouTube channel](#) and [proposal submission guide](#) for a detailed step-by-step guide to assist applicants through the Phase I proposal submission process.

The NSF Small Business Innovation Research / Small Business Technology Transfer (SBIR/STTR) program seeks to transform scientific discovery into societal and economic benefit by catalyzing private sector commercialization of technological innovations. The program increases the incentive and opportunity for startups and small businesses to undertake cutting-edge, high-quality scientific research and development. We provide grants in **phases**: a proof-of-concept / feasibility grant (6-12 months, \$225k) can potentially be followed by a longer development grant (2 years, \$750k).

**Advance registration is required; [register via WebEx](#).**

**Event: Amazon Web Services Webinar: AWS Infrastructure as Code**

**When: September 27, 2016 1.30 PM – 2.30 PM**

**Website:**

[https://publish.awswebcasts.com/content/connect/c1/7/en/events/event/private/23850344/41359021/event\\_registration.html?connect-session=graysonbreezdrem5gie8y6m2gc3&scoid=43822429&campaign-id=em\\_namer21193& charset =utf-8](https://publish.awswebcasts.com/content/connect/c1/7/en/events/event/private/23850344/41359021/event_registration.html?connect-session=graysonbreezdrem5gie8y6m2gc3&scoid=43822429&campaign-id=em_namer21193& charset =utf-8)

**Brief Description:** AWS CloudFormation lets you model, provision, and update a collection of AWS resources with JSON templates. You can manage your Infrastructure as Code and deploy stacks from a single Amazon EC2 instance to multi-tier applications. In this session, we will explore CloudFormation best practices in planning and provisioning your AWS infrastructure. We will cover recent product updates that will help users to make the most of this service and demonstrate new features. This session will benefit both new and experienced users of CloudFormation.

Learning Objectives:

- Learn best practices for managing your infrastructure as code using CloudFormation
- Discover new techniques for making the most of CloudFormation
- Hear about the latest product updates and new features released

Who Should Attend:

- Developers, DevOps, IT Operations, Systems Administrators, Solutions Architects.

**Event: Safe Genes Proposer Day; Solicitation Number: DARPA-SN-16-67**

**When: Friday, September 30, 2016 from 8:30 AM to 5:00 PM ET at the United States Institute of Peace (2301 Constitution Ave NW, Washington, DC 20037).**

**Website:**

<https://www.fbo.gov/index?s=opportunity&mode=form&id=9eeb8015fe08ce14143d5fd77f21f38c&tab=core&cvview=0>

**Brief Description:** The Biological Technologies Office (BTO) of the Defense Advanced Research Projects Agency (DARPA) is hosting a Proposers Day for the potential proposer community in support of a planned Broad Agency Announcement (BAA) for the Safe Genes Program.

The goals of the Proposers Day include:

1. Introducing the Safe Genes program vision and goals;
2. Explaining the mechanics of a DARPA program in general and the objectives and milestones of this program in particular; and
3. Encouraging and promoting teaming arrangements among organizations that have the relevant expertise, research facilities, and capabilities for executing research and development responsive to the Safe Genes program goals.

The Proposers Day will include brief overview presentations by government personnel, an information session to respond to questions from participants, "lightning" talks (three minutes, one PowerPoint slide) and posters for potential proposers to highlight technical capability or interest to promote teaming, and private sidebar meetings with the DARPA government team and potential proposer teams that can be scheduled beforehand on the registration website. Attendance at this event is not a requirement for submission of a proposal or selection for funding. Information relayed during the Proposers Day will be made available on the BTO section of the DARPA Opportunities page: <http://www.darpa.mil/work-with-us/opportunities> .

**Advance registration is required.**

**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](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

### Undergraduate Research

#### **Grant Program: Undergraduate Research and Innovation (URI) Student Seed Grants**

#### **Phase-1 URI Student Seed Grants**

#### **Phase-2 URI Student Seed Grants**

#### **Funding: NJIT Internal and External Grants**

**Website:** <http://centers.njit.edu/uri/programs/index.php>

**Description:** NJIT 2020 Vision strategic plan emphasizes providing undergraduate students an outstanding education with opportunities to have research and innovation experience as part of their NJIT learning enabling them to succeed and assume leadership roles in our society.

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

We are pleased to announce the Undergraduate Research and Innovation Student Grant (URISG) program to provide students Phase-1 Student Seed Grants of \$500 per project to pursue preliminary research or demonstrate an initial proof-of-concept/prototypes. URI Phase-2 Student Seed Grants provides up to \$3,000 per project to pursue research further or develop a complete prototype. Funds can only be used to order project supplies and prototyping through the Office of Undergraduate Research and Innovation. Phase-2 proposals may be submitted by former Phase-1 Student Seed Grant winners who have completed Phase-1 work, as well as new students who have a research or product idea that has shown the preliminary proof of concept, market assessment or application-based research to establish the need, significance and basic approach. The student may prepare URI Student Phase-1 or Phase-2 Seed Grant proposals following the template with format and guidelines on the URI website <http://centers.njit.edu/uri/programs/index.php>

**Information Session: Information session on the proposal format and guidelines on how to prepare the URI Student Seed Grant proposals will be held on September 27, 2016 from 12.00 PM to 2.00 PM in Room 240, Campus Center. A pizza lunch will be served. URI External Advisory Board members will be available to discuss format requirements and review process for student seed grant proposals.**

**Awards: Expected number of awards: 15-20**

**Up to \$500 for Phse-1 Student Seed Grants**

**Up to \$3,000 for Phase-2 Student Seed Grants**

**Deadline:** All proposals should be submitted by **October 14, 2016** following the URI Phase-1 or Phase-2 Student Project Grant Proposal Format Guidelines posted on the URI website <http://centers.njit.edu/uri/programs/index.php>. Students working with a faculty member may submit URI Student Seed Grant proposals in the required format to Ms. Angela Retino at [aretino@njit.edu](mailto:aretino@njit.edu). All proposals will be reviewed to select up to 15 finalist proposals for presentation to the External Advisory Board in the URI Workshop to be held on October 20, 2016 at the Campus Center Ballroom A from 2.00 PM to 5.00 PM.

**Contact Information:** Any questions about the program or Information Session should be directed to Ms. Angela Retino, URI Program Administrator, at [aretino@njit.edu](mailto:aretino@njit.edu).



## Internal Competition: National Science Foundation

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

**Agency: National Science Foundation NSF 16-503**

**RFP Website:** <http://www.nsf.gov/pubs/2016/nsf16503/nsf16503.htm>

**Brief Description:** The NSF Research Traineeship (NRT) program is designed to encourage the development and implementation of bold, new, and potentially transformative models for STEM graduate education training. The NRT program seeks proposals that ensure that graduate students in research-based master's and doctoral degree programs develop the skills, knowledge, and competencies needed to pursue a range of STEM careers. The NRT program includes **two tracks**: the **Traineeship Track** and the **Innovations in Graduate Education (IGE) Track**. For More information, please see the previous NJIT Research Newsletter **Issue: ORN-2016-032** or **Issue: ORN-2016-033**.

### **NJIT Internal Competition for Selection of Proposals**

**Internal Competition Deadline:** Submit an internal Letter of Intent following the NSF LOI instructions (copied below) to your college/school dean by October 7, 2016.

Dean's recommendations with the internal Letter of Intent (not more than 2 for the Traineeship Track and 2 for the Innovation in Graduation Track) should be submitted to the Office of Research for Institutional Reviews and selection by October 17, 2016. PIs and deans will be notified for selected LOIs by October 24.

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## National Science Foundation

### **Grant Program: Earth Sciences: Instrumentation and Facilities (EAR/IF)**

**Agency: National Science Foundation NSF 16-609**

**RFP Website:** <http://www.nsf.gov/pubs/2016/nsf16609/nsf16609.htm>

**Brief Description:** The Instrumentation and Facilities Program in the Division of Earth Sciences (EAR/IF) supports meritorious requests for infrastructure that promote research and education in areas supported by the Division (see <http://www.nsf.gov/div/index.jsp?div=EAR>). EAR/IF will consider proposals for:

1) **Acquisition or Upgrade of Research Equipment** that will advance laboratory and field investigations and student research training opportunities in the Earth sciences. The maximum request is \$500,000. The maximum request for upgrade of research group computing facilities remains \$75,000.

2) **Development of New Instrumentation, Techniques or Software** that will extend current research and research training capabilities in the Earth sciences. The maximum request is \$500,000.

3) **Community Facility Support** to make complex and expensive instruments, systems of instruments or services broadly available to the Earth science research and student communities. There are no maximum request limitations but potential proposers of new Community Facilities must contact cognizant Program Officers before submission.

*Planned research uses of requested instruments, software, and facilities must include basic research on Earth processes SUPPORTED BY CORE PROGRAMS OR SPECIAL PROGRAMS OF THE DIVISION OF EARTH SCIENCES (see <http://www.nsf.gov/div/index.jsp?div=EAR> for a current list of programs funded by the Division of Earth Sciences).* Support is available through grants or cooperative agreements awarded in response to investigator-initiated proposals.

Human resource development and education are expected to be an integral part of all proposals submitted to EAR/IF.

Efforts to support participation of underrepresented groups in laboratory and/or field instrument use and training are encouraged. Proposals from early career (tenure track but untenured) lead investigators are also encouraged. Such proposals will be given due consideration as part of the Broader Impacts merit review criterion.

**Awards:** Standard Grants. Anticipated funding amount: \$6,000,000

**Letter of Intent:** Not Required

**Full Proposal Submission Due Date:** Anytime

**Contacts:**

- Russell C. Kelz, telephone: (703) 292-4747, email: [rkelz@nsf.gov](mailto:rkelz@nsf.gov)
  - David D. Lambert, Program Director, 790 N, telephone: (703) 292-8558, fax: (703) 292-9023, email: [dlambert@nsf.gov](mailto:dlambert@nsf.gov)
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**Grant Program: Smart and Autonomous Systems (S&AS)**

**Agency: National Science Foundation NSF 16-608**

**RFP Website:** <http://www.nsf.gov/pubs/2016/nsf16608/nsf16608.htm>

**Brief Description:** The **Smart and Autonomous Systems (S&AS)** program focuses on **Intelligent Physical Systems (IPS)** that are **cognizant, taskable, reflective, ethical, and knowledge-rich**. The S&AS program welcomes research on IPS that are aware of their capabilities and limitations, leading to long-term autonomy requiring minimal or no human operator intervention. Example IPS include, but are not limited to, robotic platforms and networked systems that combine computing, sensing, communication, and actuation. *Cognizant* IPS exhibit high-level awareness beyond primitive actions, in support of persistent and long-term autonomy. *Taskable* IPS can interpret high-level, possibly vague, instructions, translating them into concrete actions that are dependent on the particular context in which the IPS is operating. *Reflective* IPS can learn from their own experiences and those of other entities, such as other IPS or humans, and from instruction or observation; they may exhibit self-aware and self-optimizing capabilities. *Ethical* IPS should adhere to a system of societal and legal rules, taking those rules into account when making decisions. *Knowledge-rich* IPS employ a variety of representation and reasoning mechanisms, such as semantic, probabilistic and commonsense reasoning; are cognitively plausible; reason about uncertainty in decision making; and reason about the intentions of other entities in decision making.

**Awards:** Standard Grants. Anticipated funding amount: \$16,500,000

**Letter of Intent:** Not Required

**Full Proposal Submission Due Date:** December 19, 2016

**Contacts:**

- Reid Simmons, Program Director, CISE/IIS, telephone: (703) 292-4767, email: [resimmon@nsf.gov](mailto:resimmon@nsf.gov)
  - David Corman, Program Director, CISE/CNS, telephone: (703) 292-8754, email: [dcorman@nsf.gov](mailto:dcorman@nsf.gov)
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**Grant Program: Collaborative Research in Computational Neuroscience (CRCNS)**

**Agency: National Science Foundation and National Institutes of Health NSF 16-607**

**RFP Website:** <http://www.nsf.gov/pubs/2016/nsf16607/nsf16607.htm>

**Brief Description:** Computational neuroscience provides a theoretical foundation and a rich set of technical approaches for understanding complex neurobiological systems, building on the

theory, methods, and findings of computer science, neuroscience, and numerous other disciplines.

Through the CRCNS program, the National Science Foundation (NSF), the National Institutes of Health (NIH), the German Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschung, BMBF), the French National Research Agency (Agence Nationale de la Recherche, ANR), and the United States-Israel Binational Science Foundation (BSF) support collaborative activities that will advance the understanding of nervous system structure and function, mechanisms underlying nervous system disorders, and computational strategies used by the nervous system.

Two classes of proposals will be considered in response to this solicitation:

**Research Proposals** describing collaborative research projects; and

**Data Sharing Proposals** to enable sharing of data and other resources.

Domestic and international projects will be considered. As detailed in the solicitation, international components of collaborative projects may be funded in parallel by the participating agencies. Specific CRCNS opportunities for parallel funding are available for bilateral US-German Research Proposals, US-German Data Sharing Proposals, US-French Research Proposals, US-French Data Sharing Proposals, US-Israeli Research Proposals, US-Israeli Data Sharing Proposals, and multilateral proposals involving the United States and 2 or more partnering countries (Germany, France, and/or Israel).

Appropriate scientific areas of investigations may be related to the interests of any of the participating funding organizations. Questions concerning a particular project's focus, direction and relevance to a participating funding organization should be addressed to the appropriate person in the list of agency contacts found in Section VIII of the solicitation.

**NSF will coordinate and manage the review of proposals jointly with participating domestic and foreign funding organizations, through a joint panel review process used by all participating funders.** Additional information is available in Section VI of the solicitation.

**Awards:** Standard Grants. Anticipated funding amount: \$20,000,000

**Letter of Intent:** Not Required

**Full Proposal Submission Due Date:** December 19, 2016

**Contacts:**

- Jasmine Owens, CRCNS Administrative Coordinator - NSF; Program Analyst, Division of Information and Intelligent Systems, National Science Foundation, 1125 S, telephone: (703) 292-8377, fax: (703) 292-9073, email: [jowens@nsf.gov](mailto:jowens@nsf.gov)
- Kenneth Whang, CRCNS Program Coordinator - NSF; Program Director, Division of Information and Intelligent Systems, National Science Foundation, 1125 S, telephone: (703) 292-5149, fax: (703) 292-9073, email: [kwhang@nsf.gov](mailto:kwhang@nsf.gov)
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**Grant Program: NSF/Intel Partnership on Computer Assisted Programming for Heterogeneous Architectures (CAPA)**

**Agency: National Science Foundation NSF 16-606**

**RFP Website:** <http://www.nsf.gov/pubs/2016/nsf16606/nsf16606.htm>

**Brief Description:** An emerging trend in hardware platforms is that of *architectural heterogeneity*. While modern central processing units (CPUs) provide a flexible set of hardware resources and rich instruction sets for implementing a broad spectrum of compute tasks, specialized workloads have motivated the introduction of alternative hardware architectures to accelerate operations using specialized circuit design and additional parallelism. Some examples of such hardware include graphical processing units (GPUs), digital signal processors (DSPs),

programmable accelerators, and customizable field programmable gate arrays (FPGAs). Meanwhile, CPU designs have grown in diversity also, with considerable variation in number of cores, memory hierarchy, core organization, inter-core communication, and vector instruction sets. The trend toward data centers as a new computing platform adds even more complexity. Target architectures now can include thousands of geographically distributed computing elements, varying communication speeds, complex storage hierarchies, and a diverse set of underlying hardware platforms.

Software development is now transitioning from a specialized practice by a small number of experts to an everyday skill for a broad spectrum of non-specialists. But at the same time, the increasing complexity and diversity of programming models and hardware platforms requires specialized knowledge to develop and maintain efficient software solutions. The result is a widening gap between programmers with general skills and specialized knowledge required to effectively utilize today's heterogeneous hardware platforms. Many platform types fail to be utilized to their full potential, and the performance and energy efficiency gains needed to solve the next frontier of computing challenges fail to be realized. To efficiently utilize the computing power of future computer architectures without specialized expertise will require a transformational leap in software development methodologies.

The NSF/Intel Partnership on Computer Assisted Programming for Heterogeneous Architectures (CAPA) aims to address the problem of effective software development for diverse hardware architectures through groundbreaking university research that will lead to a significant, measurable leap in software development productivity by partially or fully automating software development tasks that are currently performed by humans. The main research objectives for CAPA include programmer effectiveness, performance portability, and performance predictability. In order to address these objectives, CAPA seeks research proposals that explore

(1) programming abstractions and/or methodologies that separate performance-related aspects of program design from how they are implemented;

(2) program synthesis and machine learning approaches for automatic software construction that are demonstrably correct;

(3) advanced hardware-based cost models and abstractions to support multi-target code generation and performance predictability for specified heterogeneous hardware architectures; and

(4) integration of research results into principled software development practices.

**Awards:** Standard Grants. Anticipated funding amount: \$6,000,000

**Letter of Intent:** Not Required

**Full Proposal Submission Due Date:** December 08, 2016 - December 15, 2016

**Contacts:**

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**Grant Program: Scalable Parallelism in the Extreme (SPX)**

**Agency: National Science Foundation NSF 16-605**

**RFP Website:** <http://www.nsf.gov/pubs/2016/nsf16605/nsf16605.htm>

**Brief Description:** Computing systems have undergone a fundamental transformation from the single-core processor-devices of the turn of the century to today's ubiquitous and networked devices with multicore/many-core processors along with warehouse-scale computing via the cloud. At the same time, semiconductor technology is facing fundamental physical limits and single-processor performance has plateaued. This means that the ability to achieve performance improvements through improved processor technologies alone has ended. In recognition of this obstacle, the recent [National Strategic Computing Initiative](#) (NSCI) encourages collaborative efforts to develop, “over the next 15 years, a viable path forward for future high-performance computing (HPC) systems even after the limits of current semiconductor technology are reached (the 'post-Moore's Law era').”

Exploiting parallelism is one of the most promising directions to meet these performance demands. While parallelism has already been studied extensively and is a reality in today's computing technology, the expected scale of future systems is unprecedented. At extreme scales, factors that have small impacts today can become highly significant. For example, even short serial program sections can prove destructive to performance. Heterogeneity of processing elements [Central Processing Units (CPUs), Graphics-Processing Units (GPUs), and accelerators] and their memory hierarchies pose significant management challenges. High system complexity may lead to unacceptable latencies and mean time between failures, even if built with highly reliable components. Furthermore, the interconnectedness of large-scale distributed architectures poses an enormous challenge of understanding and providing guarantees on performance behavior. These are just four of many issues arising in the new era of parallel computing that is upon us.

The Scalable Parallelism in the Extreme (SPX) program aims to support research addressing the challenges of increasing performance in this modern era of parallel computing. This will require a collaborative effort among researchers in multiple areas, from services and applications down to micro-architecture. SPX encompasses all five NSCI [Strategic Objectives](#), including supporting foundational research toward architecture and software approaches that drive performance improvements in the post-Moore's Law era; development and deployment of programmable, scalable, and reusable platforms in the national HPC and scientific cyberinfrastructure ecosystem; increased coherence of data analytic computing and modeling and simulation; and capable extreme-scale computing. Coordination with industrial efforts that pursue related goals are encouraged.

**Awards:** Standard Grants. Anticipated funding amount: \$10,000,000

**Letter of Intent:** Not Required

**Full Proposal Submission Due Date:** January 10, 2017

**Contacts:**

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**Grant Program: Scalable Nano-manufacturing for Integrated Systems**

**Agency: National Science Foundation NSF 16-604**

**RFP Website:** <http://www.nsf.gov/pubs/2016/nsf16604/nsf16604.htm>

**Brief Description:** The National Science Foundation (NSF) announces a 7<sup>th</sup> (seventh) year of a solicitation on collaborative research and education in the area of Scalable Nanomanufacturing

for Integrated Systems (SNM-IS). This solicitation is in response to and is a component of the National Nanotechnology Initiative (NNI) Signature Initiative: Sustainable Nanomanufacturing - Creating the Industries of the Future (<http://www.nano.gov/NSINanomanufacturing>).

Many nanofabrication techniques have demonstrated the ability to synthesize small quantities of nanomaterials and nanostructures for characterization and evaluation and simple nanodevices for analysis and testing purposes. The emphasis of the Scalable Nanomanufacturing for Integrated Systems (SNM-IS) solicitation is on research in new nano-scale manufacturing concepts and integration methods to realize complex integrated systems based on nanotechnology. The research will focus on overcoming the key scientific and engineering barriers that prevent the translation of laboratory-scale discoveries in nano-enabled integrated systems to an industrially relevant scale, reliably, affordably and within sustainability and environmental, health and safety (EHS) guidelines. The goal of the SNM-IS solicitation is to study and formulate the fundamental principles of scalable nanomanufacturing and integration for nanotechnology-based integrated systems towards the eventual manufacture of useful nano-enabled products.

The SNM-IS solicitation is driven by the discovery of numerous new nanomaterials with unique properties (2D atomic layer, transition metal dichalcogenides, van der Waals heterostructures, perovskites, metal-organic frameworks, metamaterials, origami, etc.) in recent years and invention of many novel fabrication methods (nano additive manufacturing, strain engineering processing, bio-nanomanufacturing, etc.) to synthesize nanostructures with different geometries, 'microstructures' and functionalities. These nanomaterials and nanostructures need to be assembled into larger-scale components and devices, which, in turn, need to be integrated into higher-order subsystems and systems so novel and useful products can be made for a variety of applications in the areas of functional and structural materials, mechanics, optics, electronics, chemical, biomedical, catalysis, environmental, energy, sensing, security, defense, etc. Integration will need to be across material sets (0D, 1D, 2D, 3D, hierarchical nanoparticles, etc.), across length-scales (molecular to nano to micro to meso to macro), and across function (mechanical, electrical, optical, chemical, biological, thermal, etc.) and across processes (top-down, bottom-up). Integration will involve the study and implementation of hybrid manufacturing and assembly processes and methods. The research will be driven by the need to understand and establish, among others, design rules for integrated systems, manufacturing and integration process and control models, and measurement science and technology. The desired outcome will be a nano-enabled integrated system that combines many different functions together to work as one entity and that is made up of component subsystems that are designed to perform in a unified manner.

The SNM-IS solicitation seeks proposals that investigate novel scalable nanomanufacturing and integration methods for nano-enabled integrated systems with a clear commercial relevance. Proposals should consider addressing key aspects of the nanomanufacturing value chain comprised of nano-scale building-blocks → complex nanomaterials and nanostructures → functional components and devices → integrated subsystems and systems:

- Novel nanomanufacturing processes and integration strategies for large-area or continuous manufacturing or customized manufacturing of nano-scale materials and structures and their assembly into larger-scale components and devices and the integration of the components and devices into higher order structures, subsystems and systems;
- Fundamental scientific research in key, well-defined technical areas that are compellingly justified as approaches to overcome critical scientific and engineering barriers to

nanomanufacturing scale-up, customized nanomanufacturing and multi-scale integration; and

- Design principles for production systems leading to nanomanufacturing tools, and platforms; identification of manipulation and control methodologies, and metrology, instrumentation, and standards needed for process monitoring and control and to assess quality and yield; determination of process models and simulations to guide processing and integration; identification of environmental and energy footprints, as applicable.

Competitive proposals will incorporate the following three elements in their research plans:

1. A persuasive case that the nano-enabled integrated system to be manufactured has or is likely to have sufficient demand to justify eventual scale-up or meet demands for low-volume specialty materials or device systems;
2. A clearly identified set of research challenges requiring science and engineering solutions that must be addressed to enable the realization of integrated systems for the cost-effective manufacture of high quality nano-enabled products in large quantities or low-volume specialty products; and
3. A compelling research plan with clear objectives and approaches to overcome the identified research challenges. This may include environmentally benign approaches and life-cycle considerations.

These elements should be carefully explained and justified in proposals, since both the scientific novelty and the feasibility of the methods being researched will be important evaluation factors.

**The SNM-IS solicitation is NOT seeking research proposals in large-scale manufacturing of single component nanomaterials and nanostructures. Novel ideas in novel nanomanufacturing processes and scale-up may be sent to the core Nanomanufacturing (NM) Program.**

Competitive proposals are expected to address the training and education of students in nanomanufacturing, system integration and related areas. Since Scalable Nanomanufacturing for Integrated Systems research will involve addressing multiple scientific and engineering challenges in the design and manufacture of complex nano-enabled integrated systems, an interdisciplinary approach is strongly encouraged. Disciplines could range from the physical sciences (physics, chemistry, biology, materials science and others) to engineering (materials, mechanical, electrical, chemical, biomedical, industrial and others) and could include mathematics and computer science. While not required, collaborative activities with industrial or small business companies (e.g., through the GOALI program) are welcome and collaborations in which industrial partners develop industrially relevant test-beds where university and company researchers can experiment and interact are encouraged. It is advisable that such firms be consulted early in the proposal preparation process and that their intellectual contributions be clearly explained in the proposal.

Other research and education projects in nanoscale science and engineering will continue to be supported in the appropriate programs and divisions.

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

**Letter of Intent:** Not Required

**Full Proposal Submission Due Date:** January 13, 2017

**Limit on Number of Proposals per Organization: 1.** An academic institution – a university, or a campus in a multi-campus university -- may submit no more than one (1) proposal on which it is the lead organization in response to this solicitation. Potential PIs are advised to contact their institutional office of research regarding processes used to select proposals for submission. The same organization may be a collaborative partner in any number of other multi-organization group proposals in which it is not the lead. A proposal involving more than one organization

must be submitted as a single proposal in which a single award is requested, with the managing principal investigator from the lead organization and subawards administered by the lead organization to any other participating organizations.

**Internal Notification and Competition: Any PI interested in submitting this proposal must notify Atam Dhawan, Vice Provost for Research at [dhawan@njit.edu](mailto:dhawan@njit.edu) through the office of the respective college dean with a Letter of Intent no later than November 1, 2016. College and institutional level reviews will be set-up as needed.**

**Contacts:**

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  - Nora F. Savage, telephone: (703) 292-7949, email: [nosavage@nsf.gov](mailto:nosavage@nsf.gov)
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## **National Institutes of Health**

### **Grant Program: BRAIN Initiative: Standards to Define Experiments Related to the BRAIN Initiative (R24)**

**Agency: National Institutes of Health RFA-MH-17-256**

**RFP Website:** <http://grants.nih.gov/grants/guide/rfa-files/RFA-MH-17-256.html>

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

The first FOA will create the data standards that are needed to describe the new experiments that are being created by or used in the BRAIN Initiative (this FOA). The second FOA will create the data infrastructures that will house the data from multiple experimental groups (RFA-MH-17-255). The final FOA (RFA-MH-17-257) supports the development of software to visualize and analyze the data. The visualization/data analysis tools will make use of the standards and will be built so that they can be integrated into the data repositories; similarly, the data repositories are expected to use the standards created in awards under the first FOA. Awardees under all FOAs will work together. Awardees in all groups should budget for hackathons and other collaborative efforts that will be necessary to integrate the products produced by all awardees. Collaborations with neuro-informatics efforts outside of the BRAIN Initiative are both welcome and are encouraged.

The purpose of this FOA is to provide short term support to enable researchers from a particular research sub-domain to develop standards for new experimental protocols that are being used or could be used as part of the BRAIN Initiative. The development of such standards can take many different pathways, but for this FOA there is a particular pathway that is strongly recommended. That pathway includes:

1) Assembling a team to develop the standards. This team must include a group of experimentalists who are collecting data in the sub-domain as well as informaticists who will work with the group to make a standard that can be used by other researchers and by other



informatics efforts. It is expected that the group of researchers will cover the different varieties of experiment that are being done in the sub-domain.

2) Developing a prototype standard using the expertise of the group. Applicants are strongly encouraged to have participating groups share their actual data between members of the group, or beyond, along with their current analysis tools to make sure that the developing standard is robust and fully describes the way that data are currently being collected throughout those in the sub-domain, consistent with achieving the goals of the program. It is expected that a prototype standard will be developed in the first year of an award.

3) Soliciting community comment on the proposed standard and developing a mechanism to incorporate these comments into the final standard. Soliciting broad community comment once a prototype standard has been developed is essential to ensure that the proposed standard will be useful to the entire sub-domain.

4) Ensuring that standards are valuable and are used. It is expected that the standards developed under this FOA will be adopted by the BRAIN Initiative, and in particular by the data repository that is funded to collect the data from this sub-domain (see RFA-MH-17-255 to find the related FOA that establishes BRAIN Initiative data repositories). Applicants should propose additional ways of encouraging the use of the standard such as working with journals to encourage them to adopt the standard for papers that they publish.

5) Making the standard widely available to the research community consistent with achieving the goals of the program. Applicants can use a variety of strategies to make the standard widely available.

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

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

**Deadline:** January 10, 2017 and October 11, 2017, by 5:00 PM local time of applicant organization. [All types of non-AIDS applications](#) allowed for this funding opportunity announcement are due on these dates.

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.

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## **Grant Program: BRAIN Initiative: Data Archives for the BRAIN Initiative (R24)**

**Agency: National Institutes of Health RFA-MH-17-255**

**RFP Website:** <http://grants.nih.gov/grants/guide/rfa-files/RFA-MH-17-255.html>

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

The first FOA will create the data standards that are needed to describe the new experiments that are being created by or used in the BRAIN Initiative (this FOA). The second FOA will create the data infrastructures that will house the data from multiple experimental groups (RFA-MH-17-255). The final FOA (RFA-MH-17-257) supports the development of software to visualize and analyze the data. The visualization/data analysis tools will make use

of the standards and will be built so that they can be integrated into the data repositories; similarly, the data repositories are expected to use the standards created in awards under the first FOA. Awardees under all FOAs will work together. Awardees in all groups should budget for hackathons and other collaborative efforts that will be necessary to integrate the products produced by all awardees. Collaborations with neuro-informatics efforts outside of the BRAIN Initiative are both welcome and are encouraged.

The purpose of this FOA is to provide support for the creation and management of more than one data archive to hold data related to the BRAIN Initiative. The data that will be deposited in a particular archive need not be restricted to data sets funded by BRAIN Initiative awards. Applicants are strongly encouraged to extend existing data archives if possible.

The data archive is expected to use relevant standards that describe BRAIN Initiative experiments. Such standards may be developed under RFA-MH-17-256 or may already exist.

A data archive will develop a data submission pipeline ensuring appropriate quality control standards for laboratories who are trying to upload data. For example, if an experimental standard defines an allowable range of values for a particular data element, the submission pipeline should make sure that uploaded data respect the current data standard. Ideally, the data archive will create both a submission pipeline and a related validation tool to allow researchers to check the quality of their data even if they are not trying to upload data. Such validation tools should help the research community improve [the rigor and reproducibility](#) of their data. Data submission pipelines that originate with the data collection instrument in the depositor's laboratory and require minimal manual intervention would be ideal but are not required.

A data archive will work closely with BRAIN Initiative awardees and others to collect and archive relevant datasets. Each data archive should plan for a help desk to work with those who are trying to upload data. Each data archive must develop plans to make the data readily available to the broad research community and to citizen scientists, as appropriate. Depending on the type of data, data submission agreements and data access agreements may be necessary.

The preceding two paragraphs focused on uploading raw data from a data collection instrument. In many cases, processed data may be as useful, to the research community, as the raw data produced in the laboratory. Each data archive should consider storing and curating the appropriate data (either raw or processed) and make it available to the community.

A data archive may propose evaluating deposited data and scoring them to allow the research community to have some guidance about data quality. Each data archive should plan to assign persistent identifiers to deposited data and to processed data to allow the research community a very easy way to cite the data sets that are being used.

A data archive should allow researchers to have a space where they can share data privately to facilitate collaboration prior to publication. Such private enclaves must only last for a defined period of time before that data set is shared with the rest of the research community.

A data archive may help users deposit data into other sustainable databases, such as those supported by the [National Center for Biotechnology Information](#), but this is not a requirement. There may be cases where data are stored in more than one data archive. In those cases, a data archive funded under this FOA will ensure that the user community can find all relevant data using appropriate linkages or database federation strategies no matter where the data are actually stored.

Furthermore, each data archive will provide an interface that is accessible to anyone with a web browser. A data archive will make appropriate query tools and summary data easily available to allow the research community to check whether data of interest are held in the archive. The user interface should make the maximum amount of information available to the research community while considering user friendliness and ease of interpretation. The web

site is expected to have a broad user base that will include both naïve users and experienced bioinformaticians, and should provide an interface that will accommodate both types of users.

In many cases, users will want to analyze and/or use visualization tools to interact with the data without downloading any data. Those interactions should be anticipated by the data archive. Expensive computations could result from some analysis activities, and the data archive should explain plans to deal with such eventualities. A data archive may, but is not required to, use cloud storage and computing capabilities to enable the research community to analyze data without downloading it. A data archive should (but it is not required to) allow users to bring their own analysis tools to the data.

Each data archive will be expected to have staff who are knowledgeable about informatics and the experimental data being collected. The informaticists will be responsible for coordination with other relevant informatics efforts. In particular, a data archive will be expected to identify and federate the archive with other data repositories and knowledge bases, as appropriate. This data archive integration should create ways for users to query all relevant data repositories for relevant information. Funded data archives will be members of a larger BRAIN Initiative Data Network that will work across BRAIN Initiative activities to promote integration of a variety of data types. In addition, the data archive will interact, as appropriate, with informatics activities outside of the BRAIN Initiative such as the NIH [BD2K](#) effort and the work of the [International Neuroinformatics Coordination Facility](#).

When possible, a data archive is expected to use existing infrastructures and standards. These could include persistent identifiers such as Digital Object Identifiers and/or Resource Identifiers. The awardee will have the responsibility for operating an infrastructure that is useful to the community. While there will be some parts of the application that propose to do research for optimal solutions, the focus should be on delivering the infrastructure – not on research.

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

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

**Deadline:** January 17, 2017 and October 19, 2017, by 5:00 PM local time of applicant organization. [Alltypes of non-AIDS applications](#) allowed for this funding opportunity announcement are due on these dates.

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

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

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**Grant Program: BRAIN Initiative: Integration and Analysis of BRAIN Initiative Data (R24)**

**Agency: National Institutes of Health RFA-MH-17-257**

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

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

The first FOA will create the data standards that are needed to describe the new experiments that are being created by or used in the BRAIN Initiative (this FOA). The second FOA will create the data infrastructures that will house the data from multiple experimental groups (RFA-MH-17-255). The final FOA (RFA-MH-17-257) supports the development of software to visualize and analyze the data. The visualization/data analysis tools will make use of the standards and will be built so that they can be integrated into the data repositories; similarly, the data repositories are expected to use the standards created in awards under the first FOA. Awardees under all FOAs will work together. Awardees in all groups should budget for hackathons and other collaborative efforts that will be necessary to integrate the products produced by all awardees. Collaborations with neuro-informatics efforts outside of the BRAIN Initiative are both welcome and are encouraged.

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

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

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

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

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

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

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

- Modification of software that was originally used in a particular laboratory to run in a cloud environment and to accept data from multiple sources.
- Modification of software to make use of standards that are now being used to describe BRAIN Initiative experiments.

- Extension of software that was originally used to analyze/visualize data from outside the BRAIN Initiative to accept BRAIN Initiative data.
- Modification of software where the user can perform dynamical exploration of a space described by multiple parameters simultaneously.
- Modification of software to enable biophysical parameter fitting and extraction.
- Development or extension of tools that are able to perform un-biased cluster analysis and visualization of functional mechanisms in the brain.
- Development or extension of tools that are able to predict and visualize future trends based on the current state of the system.
- Creation of new software to analyze and visualize BRAIN initiative data.
- Development or extension of tools to link different types of data relevant to the BRAIN Initiative. These tools could:
  - allow searches across multiple data repositories for data relevant to a researcher. However, tools that focus on the development of broad ontologies will not be responsive and will be withdrawn prior to peer review. Applications that focus on the development of a narrow ontology for a particular purpose are an acceptable component of an application.
  - develop new methods to find and link data at different scales such linking individual cell level data to data about meso-scale constructs such as circuits and networks.

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

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

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

**Deadline:** January 19 2017 and October 26, 2017, by 5:00 PM local time of applicant organization. [All types of non-AIDS applications](#) allowed for this funding opportunity announcement are due on these dates.

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

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

## **Grant Program: BRAIN Initiative: New Concepts and Early-Stage Research for Large-Scale Recording and Modulation in the Nervous System (R21)**

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

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

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

Achieving these goals requires the ability to record simultaneously from thousands or tens-of-thousands of neurons contributing to the dynamic activity in a neural circuit. The relevant activity may be in clusters of cells packed closely together or may be in widely distributed circuits. Current microelectrode and imaging technologies are limited in the number of cells from which activity can be isolated and sampled simultaneously, by the size or location

of the area to be sampled, by the depth of penetration, and by the invasiveness of the technique that might prohibit their use in human experimentation. Non-invasive technologies suitable for use in humans are currently limited in spatial resolution and temporal dynamics, as well as in their reflection of on-going electrical activity in circuit elements. This FOA seeks entirely new ideas, concepts and/or approaches from physics and engineering, and biology, for how these limitations might be overcome to enable increased recording capabilities on the scale of one or more orders of magnitude beyond that of current technology.

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

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

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

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

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

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

**Letter of Intent:** Not Required.

**Deadline:** December 7, 2016, by 5:00 PM local time of applicant organization. All [types of non-AIDS applications](#) allowed for this funding opportunity announcement are due on this date.

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

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**Grant Program: NLM Express Research Grants in Biomedical Informatics (R01)**

**Agency: National Institutes of Health PAR-16-404**

**RFP Website:** <http://grants.nih.gov/grants/guide/pa-files/PAR-16-404.html>

**Brief Description:** The National Library of Medicine (NLM) offers support for innovative research in biomedical informatics and data science. The scope of NLM's interest in the research domain of informatics is broad and interdisciplinary, developing methods and approaches in biomedical computing, data science and related information fields for application domains of health and biomedicine, including health care delivery, basic biomedical research, clinical and translational research, precision medicine, public health, biosurveillance, health information management in disasters, and similar areas. NLM defines biomedical informatics as the science of optimal representation, organization, management, integration and presentation of information relevant to human health and biology, for purposes of learning, sharing and use. Informatics research produces concepts, tools and approaches that advance what is known in the field and have the capacity to improve human health. Informatics projects of interest to NLM involve the application of computer, data and information science concepts to research problems in a biomedical domain. NLM supports research projects focused on biomedical (rather than informatics) research questions only when they employ novel or advanced informatics techniques applied to information and data produced by others.

The following basic informatics problem areas demonstrate the scope of NLM's research interests:

- Information & knowledge processing, including understanding, translation or summarization of natural language in real-time or near real-time, automated assignment of metadata
- Integration of very large data sets and/or heterogeneous data types to support discovery, learning and health care
- Advanced information retrieval, knowledge discovery in very large or heterogeneous data sets, discovery mining, and other techniques for in silico discovery and research including approaches for accelerating the linkage of phenotypic and genomic information
- Incorporation of machine intelligence into knowledge tools and resources for use by health care providers, scientists and consumers
- Models of complex data, simulations, information visualization and presentation approaches to enhance decisions, learning or understanding, particularly in large and heterogeneous data sets
- Innovative approaches for ensuring accuracy, privacy and security of clinical and biomedical research data
- Support for consumer and patient engagement in understanding, accessing, sharing, protecting and using their own health data

Examples of application domains for these informatics problem areas include, but are not limited to:

- Health Care; Public Health; Disaster Information Management
- Biological, Social and Behavioral Research relating to human health
- Multi-level computational models of biological and clinical processes
- Translational Research that supports integration and linking of all available data relating to a person's health, regardless of the source, including clinical data, personal health records, environmental data, and other relevant data

- Information Sciences; Simulation; User customization; Virtual environments; Intelligent agents

Informatics research may be done by individual investigators or by teams. NLM expects that investigators will employ rigorous, scientifically-defensible research techniques that lead to sound empirical evidence which can be reproduced using the same approach. These techniques may include quantitative and qualitative approaches, such as laboratory and field studies, in silico experiments, simulation studies, model generation and testing, and other advanced approaches. Although biomedical informatics research routinely involves data from health care and biology, the majority of projects funded by NLM will undertake research that advances science in the fields of informatics and biomedicine.

An application to NLM's research grant program should focus on a well-defined research problem and propose a rigorous research design, based on preliminary studies, which will result in innovations that advance what is known in the field of informatics and have the capacity to improve human health. NLM will not support infrastructure development or continued development of existing software tools or knowledge resources as an endpoint of research funded through this FOA, though such tools, data sets or other compilations of knowledge may be used to test ideas and methods. Applicants interested in building or sustaining tools and research resources should consider opportunities such as [PA-14-155](#) "Early Stage Development of Technologies in Biomedical Computing, Informatics, and Big Data Science (R01)" or [PAR-14-156](#) "Extended Development, Hardening and Dissemination of Technologies in Biomedical Computing, Informatics and Big Data Science (R01)".

**Awards:** The NLM Express Research Grant has a limit of \$250,000 per year in direct costs.

**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.

## **Department of Defense/US Army/DARPA/ONR**

### **Grant Program: Reconfigurable Imaging (ReImagine)**

**Agency:** Department of Defense DARPA DARPA-BAA-16-56

**Website:**

<https://www.fbo.gov/index?s=opportunity&mode=form&id=4f92ee6b62df0cc7e021a06a1372c258&tab=core&cvview=0>

**Brief Description:** DARPA is soliciting research proposals to demonstrate multifunctional imaging sensors that are reconfigurable through software. Proposers will build around a common digital framework that can be customized for specific applications. Both passive and active modes are desired. Also of interest are proposals that develop adaptive algorithms that optimize the operation of a reconfigurable sensor in real time to optimize information collection.

**Awards:** Approximately \$20M in awards are anticipated.

**Deadline:** November 10, 2016.

**Contact:** Dr. Jay Lewis, Program Manager BAA Coordinator: DARPA-BAA-16-56@darpa.mil  
DARPA/MTO



## Department of Energy

### **Grant Program: Request For Information On Potential Technical Focus Areas For Advanced Manufacturing - Related Traineeships**

**Agency:** Department of Energy DE-FOA-0001635

**Website:** <https://eere-exchange.energy.gov/#FoalId701f4169-15f7-46ae-85af-99acb2ab9c0c>

**Brief Description:** The Department of Energy (DOE) funds university-led traineeship programs that strategically address workforce training needs in key technical focus areas. The following objectives guide DOE's Office of Energy Efficiency and Renewable Energy (EERE) Advanced Manufacturing Office's (AMO) traineeship efforts:

- Advance the DOE mission relative to advanced manufacturing – DOE funded Traineeship Programs are designed and implemented to advance specific Science, Technology, Engineering and Math (STEM) workforce competencies required for the DOE's unique mission to ensure America's security and prosperity by addressing its science, energy, and environmental challenges.
- Address priority STEM workforce needs and identified gaps – DOE funded Traineeship Programs focus on advancing those critical STEM disciplines and competencies specifically relevant to the EERE and AMO missions where other U.S. Government or academic workforce development programs either do not exist or where DOE-relevant applications are not being leveraged to support specific DOE mission responsibilities.

In July 2015, EERE released a Funding Opportunity Announcement (FOA) to address emerging needs in graduate training enabling preparedness for the field of advanced Power Electronics Engineering careers beyond those in academia. As a result, EERE made two competitively-selected awards supporting five-year graduate-level programs in Power Electronics Engineering, leveraging existing DOE assets including the wide band gap National Network for Manufacturing Innovation (NNMI) Institute, PowerAmerica.

The purpose of this Request for Information (RFI) is to gather from industry, academia, research laboratories, government agencies, and other stakeholders on issues related to future EERE-funded and AMO-funded graduate-level Traineeships. This RFI is not a FOA; therefore, DOE is not accepting applications at this time.

**Deadline:** Responses must be received no later than 5:00pm (ET) on October 14<sup>th</sup>, 2016.

#### **Contact Information:**

- [EERE-ExchangeSupport@hq.doe.gov](mailto:EERE-ExchangeSupport@hq.doe.gov)
  - EERE Exchange support.
  - [AMOTraineeship@ee.doe.gov](mailto:AMOTraineeship@ee.doe.gov)
- Responses to this Request for Information

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## NASA

### **Grant Program: Research Opportunities for Post-Doctoral Fellowships in Space Biology to Study the Microbiome of the ISS as a Built Environment: Using ISS as a Microbiological Observatory**

**Agency:** NASA NNH16ZTT001N-MOBE

**Website:**

<https://nspires.nasaprs.com/external/solicitations/summary.do?method=init&solId=%7BFE2BC597-6229-8D42-F93C-1977931CEF86%7D&path=open>

**Brief Description:** This National Aeronautics and Space Administration NRA “Appendix B - Research Opportunities for Post-Doctoral Fellowships in Space Biology to Study the Microbiome of the ISS as a Built Environment: Using the International Space Station (ISS) as a Microbiological Observatory” is an Appendix to the NASA Omnibus Research Announcement ROSBio-2016 (NNH16ZTT001N NRA). NASA is soliciting, through this Appendix, research applications for Postdoctoral Fellowships from early career scientists to design experiments that utilize a NASA collection of ISS microbial isolates collected over a decade or more to help understand better how microbial communities colonize, adapt, and evolve on the ISS. All proposals must propose experiments that utilize these microbial isolates collected from the ISS that have been archived at the Johnson Space Center.

**Awards:** NASA anticipates that up to 2 awards will be made for the research requested in this NRA and that each grant will last 2 years for a total cost of \$140K. Appendix B, which will be released on or about September 15, 2016 can be found by opening the NASA Research Opportunities homepage at <http://nspires.nasaprs.com/> and then linking through the menu listings "Solicitations" to "Open Solicitations."

**Deadline:** Mandatory notices of Intent (NOIs) are due October 31, 2016 at 5 PM Eastern Time. NOIs are required to facilitate peer review planning. Full proposals are due November 30, 2016 at 5 PM Eastern Time. Announcement of selections will be made on or about March 1, 2017. Proposals and NOIs must be submitted electronically by an authorized official of the proposing organization. Proposers may use either NSPIRES (<http://nspires.nasaprs.com/>) or Grants.gov (<http://www.grants.gov>) for proposal submission. However, NOIs must be submitted using NSPIRES. NASA’s selection of research projects will be guided by recommendations of the National Research Council’s 2011 Decadal Survey Report, “Recapturing a Future for Space Exploration: Life and Physical Sciences Research for a New Era” (<http://www.nap.edu/catalog/13048.html>) Proposals will be accepted from Graduate students in the final year of their PhD or equivalent doctoral degree program, from Postdoctoral fellows (PhD, MD, DDS, DVM or equivalent doctoral degree from an accredited domestic or foreign institution) or from applicants who received a doctoral degree within the past 2 years, but have not yet had post-doctoral training. The solicitation is open to U.S. citizens, permanent residents, or persons with pre-existing visas obtained through their sponsoring institutions that permit postdoctoral training for the project’s duration. Sponsoring institutions must be U.S. Academic, government, or commercial institutions that will provide appropriate postdoctoral mentors. Successful applicants may collaborate with investigators from universities, Federal Government laboratories, the private sector, state and local government laboratories and other countries with the exception of China. Every organization that intends to submit a proposal in response to Appendix B must be registered with NSPIRES, and such registration must identify the authorized organizational representative(s) who will submit electronic proposals. Instructions on how to register in NSPIRES are described in the omnibus NRA (NNH16ZTT001N NRA). Each electronic proposal requires the registration of postdoctoral applicants, their principal investigator mentors, and any other participants. Potential proposers and proposing organizations are urged to access the system(s) well in advance of the proposal due date(s) to familiarize themselves with its structure and enter the requested information. Questions about ROSBio-2016 (NNH16ZTT001N NRA) and this Appendix may be addressed to the contacts referenced in the full solicitation document.

**Contact:** Dr. David L. Tomko, Program Scientist for Space Biology Life and Physical Sciences Division, NASA Headquarters Phone: 202-358-2211 Email: [dtomko@nasa.gov](mailto:dtomko@nasa.gov) NASA contracting information for this NRA is available from: Benjamin S. Benvenuti, Lead Contract Specialist NASA Shared Services Center Phone: (228) 813-6128. Email: [benjamin.s.benvenuti@nasa.gov](mailto:benjamin.s.benvenuti@nasa.gov)

## **McKnight Endowment Fund for Neuroscience**

**Grant Program: Technological Innovations in Neuroscience Awards**

**Agency: 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.

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

**Deadline:** Applications for the McKnight Endowment Fund for Neuroscience Scholar Award due *December 5, 2016*.

**Contact:** Eric Blitz at [blitz@njit.edu](mailto:blitz@njit.edu)

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## **Blavatnik National Awards**

**Grant Program: 2017 Blavatnik National Awards**

**Agency: Blavatnik Awards for Young Scientists**

**Website:** <http://blavatnikawards.org/awards/national-awards/>

**Brief Description:** NJIT is eligible to nominate one young faculty member in each of the three award categories:

- Blavatnik National Award for Young Scientists in Life Sciences
- Blavatnik National Award for Young Scientists in Physical Sciences & Engineering
- Blavatnik National Award for Young Scientists in Chemistry

**Nomination must be submitted by President, Provost or other designated representative of the university.**

**Awards:** Every year, one nominee in each category will be named a Blavatnik Laureate and awarded \$250,000 in unrestricted funds.

**Deadline:** November 16, 2016.

**Contact:** Eric Blitz at [blitz@njit.edu](mailto:blitz@njit.edu)

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