

# NJIT Research Newsletter

Issue: ORN-2019-06

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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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## Special Announcements

### **Intellectual Property/Entrepreneurship/Inventions Open House** TechQuest Innovation Competition Undergraduate Research and Innovation (URI)

February 19, 2019; 11:00am-12:00pm  
Campus Center Ballroom B

The Intellectual Property/Entrepreneurship/Inventions Open House will present information on opportunities for patents and commercialization. Faculty, Staff and students including undergraduate students applying for Techquest Innovation Competition are encouraged to attend to discuss intellectual property and entrepreneurship issues

#### Agenda

- 11:00 AM-11:10 AM Patent process, patentability requirements and prior art issues  
*Sanjiv Chokshi, Esq., Assistant General Counsel for Patents and Intellectual Property, NJIT*
- 11:10 AM -11:20 AM Entrepreneurial opportunities, elevator pitch, and leadership  
*Simon Nynens, Vice President of Business Incubation, NJIT*
- 11:20 AM -11:40 AM Inventions  
*Charlie Kannankeril is an inventor with seventy patents and author of The Inventor In You.*
- 11:40 AM - 12:00 PM Questions & Networking
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## **Undergraduate Research and Innovation (URI) URI Student Seed Grants: Spring 2019**

**Phase-1 Student Seed Grants: \$500 per project  
URI Phase-2 Student Seed Grants: \$3,000 per project**

**Track-1 Technology/Product Development and Innovation  
Track-2: Application Based Research**

Proposal Submission Deadline: February 25, 2019  
URI Workshop New Proposal Presentations:  
March 12, 2019; 2.00 PM – 5.30 PM; Ballroom A, Campus Center

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.

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 templates with [format and guidelines](#).

All projects proposals should be submitted by **February 25, 2019**. Awardees will have access to funds to start the project as early as March 22, 2019 and will formally present progress report at the subsequent URI workshops.

### **Special Funding Projects**

Special funding is available for URI Phase-1 and Phase-2 projects in the following areas.

1. **Energy Monitoring:** The projects can focus in energy efficiency and monitoring covering one of more of the following topics:
  - o Development of hypotheses and analysis of the energy consumption data from Newark Public Schools (NPS) to determine possible course of action for NPS and other City buildings in Newark.
  - o Study of building energy and water systems in the government (state, city, county) buildings in Newark to make recommendations for Energy Efficiency Measures
  - o Piloting Noveda (<https://www.noveda.com/>) monitoring system in one multifamily city buildings in Newark to study the impact of data visualization on behavior.

2. **Architecture and Design:** In the interest of expanding the reach of the URI program, Manish Patel would like to sponsor a special category for students from the CAD. These projects should have a path to market and not be theoretical. To remain in sync with the “R” of URI, the research component of the projects can be demonstrated by how students did product research, market need research and competitive research. Phase-1 projects can focus on the proof of concept and feasibility of the design. Phase-2 projects can focus on product development that are in “Ready-to-Launch” phase. The design projects may include but not limited to the following areas:
- Architecture
  - Digital Design
  - Industrial Design
  - Interior Design

Other areas of sponsored funding include medical devices, sensors, diabetes management and therapeutic intervention, sustainable systems, human-machine interface, human-computer interface, and data science and analytics.

### **Proposal Submission Deadlines**

- Students working with a faculty member may submit **Track-1 Technology/Product Development and Innovation or Track-2: Application Based Research** proposals in the required format by **February 25, 2019**. Proposal Format Guidelines information are [here](#) and on the [URI website](#).
- Complete and submit the [Spring 2019 Student Seed Grant Application](#) by **February 25, 2019**. You will need to have your research proposal ready to upload when you fill out the online application form.
- Finalists selected for URI workshop presentation will be announced by **March 1, 2019**. Finalists are required to present their project through a PowerPoint presentations to the External Advisory Board following the presentation format posted on the website at the URI Workshop on **March 12, 2019** at the Campus Center Ballroom A from 2.00 PM to 5.30 PM.

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).

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### **Medical Technology Enterprise Consortium (MTEC) Funding Opportunities**

The Medical Technology Enterprise Consortium (MTEC) is excited to post this pre-announcement for a Request for Project Proposals (RPP) focused on developing scalable, production-ready, commercial prototypes and processes for cell, tissue, or organ bioengineering technologies that will overcome current challenges and enable successful current Good Manufacturing Practice (cGMP) and clinical translation of regenerative medicine based therapies.

#### Technology Focus Areas

The Joint Program Committee (JPC)-8/Clinical and Rehabilitative Medicine Research Program (CRM RP), the Defense Health Agency, Research, Development and Acquisition (DHA RDA), and the Office of the Assistant Secretary of Defense for Health Affairs (OASD(HA)) have identified a need for regenerative medicine prototype development efforts and manufacturing technologies. cGMP quality is a requirement by the U.S. Food and Drug Administration (FDA) and European Medicines Agency to provide patients with clinical-grade products that are safe and have defined quality characteristics. However, standardization and robust manufacturing techniques are lacking in regenerative

medicine, which will continue to impede progress in advancing regenerative medicine based technologies and treatments toward the clinic. This is likely due to many factors which need to be developed and advanced, including:

- (1) advancing bioreactor technology for cost-effective cell and tissue expansions,
- (2) improving cell, tissue, and organ preservation technology,
- (3) innovating and advancing large scale manufacturing and quality assurance for regenerative medicine based products, and
- (4) developing dynamic and innovative quality assurance strategies for regenerative medicine manufacturing.

*This upcoming RPP is a follow-on effort to MTEC's previous (2016) Regenerative Medicine Manufacturing RPP, where several technologies of interest were funded. This RPP focuses on the capability gaps that remain unfunded or underfunded by the DoD.*

For more details, please see the Grant Opportunities section below.

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### **Grant Opportunity Alerts**

Keywords and Areas Included in the Grant Opportunity Alert Section Below

**NSF:** Faculty Development in the Space Sciences; EHR Core Research: Production Engineering Education and Research (ECR: PEER); Signals in the Soil (SitS); Cyber-Physical Systems (CPS); ADVANCE: Organizational Change for Gender Equity in STEM Academic Professions (ADVANCE); Growing Convergence Research (GCR); Harnessing the Data Revolution (HDR): Transdisciplinary Research in Principles of Data Science Phase I (HDR TRIPODS Phase I); Harnessing the Data Revolution (HDR): Institutes for Data-Intensive Research in Science and Engineering; Cyberinfrastructure for Sustained Scientific Innovation (CSSI); A Science of Science Policy Approach to Analyzing and Innovating the Biomedical Research Enterprise (SCISIPBIO); Improving Undergraduate STEM Education: Computing in Undergraduate Education (IUSE: CUE); Distributed Array of Small Instruments (DASI); Harnessing the Data Revolution (HDR): Institutes for Data-Intensive Research in Science and Engineering - Ideas Labs (I-DIRSE-IL)

**NIH:** Shared Instrumentation Grant (SIG) Program (S10); Shared Instrumentation for Animal Research (SIFAR) Grant Program (S10); High-End Instrumentation (HEI) Grant Program (S10); NHLBI Emerging Investigator Award (EIA) (R35); Summer Research Education Experience Program (R25) Bioengineering Research Grants (BRG) (R01) Bioengineering Research Partnerships (U01) Exploratory/Developmental Bioengineering Research Grants (EBRG) (R21) Resources for Technology Dissemination (U24); NIH Research Evaluation and Commercialization Hub (REACH) Awards (U01); Biomedical Research Facilities (C06); Graduate Research Training Initiative for Student Enhancement (G-RISE) (T32); Limited Competition: Clinical and Translational Science Award (CTSA) Program: Exploratory Collaborative Innovation Awards (R21); NIH Research Project Grant (Parent R01); NIH Exploratory/Developmental Research Grant Program (Parent R21); NIH Research Project Grant (Parent R01)

**Department of Transportation:** Infrastructure for Rebuilding America (INFRA) Grant Program

**Department of Defense/US Army/DARPA/ONR:** ERDC Broad Agency Announcement; Measuring Biological Aptitude; Intelligence Community Centers for Academic Excellence (IC CAE) Program; Combat Casualty Care - Multi-Domain Lifesaving Trauma Innovations (MuLTI) Award; CDMRP PRMRP Discovery Award; CDMRP Peer Reviewed Medical Research Program Technology/Therapeutic Development Award; CDMRP Peer Reviewed Medical Research Program Focused Program Award; CDMRP Peer Reviewed Medical Research Program Investigator-Initiated Research Award; Technologies for Mixed-mode Ultra Scaled Integrated Circuits (T-MUSIC); Guaranteed Architecture for Physical

Security (GAPS); Long Range BAA; Office of Naval Research (ONR) Navy and Marine Corps Science, Technology, Engineering & Mathematics (STEM), Microsystems Technology Office (MTO); AFRL/RXC Structural Materials Open BAA; BROAD AGENCY ANNOUNCEMENT (BAA) for Extramural Biomedical Research and Development; NRL Long Range Broad Agency Announcement (BAA) for Basic and Applied Research

**Department of Education:** Fulbright-Hays Group Projects Abroad (GPA) Short-Term Project)

**EPA:** A National Student Design Competition Focusing on People, Prosperity and the Planet - Safe and Sustainable Water Resources

**Department of Energy:** Notice of Intent to Issue Funding Opportunity Announcement No. DE-FOA-0002022; FY 2019 Bioenergy Technologies Office (BETO) Multi-topic Request for Information (RFI)

**NASA:** ROSES 2018: Remote Sensing Theory for Earth Science; ROSES 2018: Advanced Information Systems Technology

**National Endowment of Humanities:** Institutes for Advanced Topics in the Digital Humanities

**Medical Technology Enterprise Consortium (MTEC):** Support for Cell, Tissue, or Organ Bioengineering Technologies

**Environment Research and Education Foundation:** Research on Research on Sustainable Solid Waste Management and Recycling

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

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

**PI:** Bin Chen (PI)

**Department:** Center for Solar Terrestrial Research

**Grant/Contract Project Title:** CAREER: Probing Energy Release in Solar Explosive Events with New Generation Radio Telescopes

**Funding Agency:** NSF

**Duration:** 01/15/17-12/31/21

**PI:** Kevin Belfield (PI)

**Department:** Chemistry and Environmental Sciences

**Grant/Contract Project Title:** Research and Engineering Program/NEW JERSEY-1

**Funding Agency:** DOD (Department of the Army)

**Duration:** 10/01/18-09/30/19

**PI:** Edward Dreizen (PI)

**Department:** Chemical and Material Engineering

**Grant/Contract Project Title:** Mechanochemical Nitration of Organic Compounds

**Funding Agency:** Department of Defense

**Duration:** 01/21/19-01/20/20

**PI:** Bin Chen (PI)

**Department:** Center for Solar Terrestrial Research

**Grant/Contract Project Title:** Particle Energization in Solar Flares: Combining Observations from a Suite of NASA Missions with the Jansky Very Large Array

**Funding Agency:** NASA

**Duration:** 01/01/17-12/31/19

**PI:** Nathaniel Frissell (PI)  
**Department:** Center for Solar Terrestrial Research  
**Grant/Contract Project Title:** Ham Radio Science Citizen Investigation (HamSCI) Workshop 2019  
**Funding Agency:** NSF  
**Duration:** 02/15/19-01/31/20

**PI:** Haimin Wang (PI), Ju Jing (Co-PI), Yan Xu (Co-PI) and Vasyl Yurchyshyn (Co-PI)  
**Department:** Center for Solar Terrestrial Research  
**Grant/Contract Project Title:** Exploring Small-Scale Energy Release Phenomena Above and Around Sunspots  
**Funding Agency:** NASA  
**Duration:** 03/01/19-02/28/22

**PI:** Alexander Kosovichev (PI)  
**Department:** Center for Solar Terrestrial Research  
**Grant/Contract Project Title:** Statistical Study of Emerging Active Regions Using Deep-Focus Local Helioseismology  
**Funding Agency:** NASA  
**Duration:** 10/01/18-09/30/20

**PI:** Hai Nhat Phan (PI)  
**Department:** Informatics  
**Grant/Contract Project Title:** CRII: SaTC: PrivateNet - Preserving Differential Privacy in Deep Learning under Model Attacks  
**Funding Agency:** NSF  
**Duration:** 02/15/19-01/31/21

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

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

**R&D Budget Allocations:** The spending measure signed into law Friday--covering seven remaining FY 2019 bills-- boosts funding for NASA, the National Science Foundation, and agricultural research, and maintains level amounts for key R&D at the National Institute of Standards and Technology and the Department of Homeland Security's Science and Technology account. In most cases, the bill provides substantially more than proposed by the Trump administration. Here are the numbers:

NASA: \$21.5 billion -- \$763.9 million above the FY 2018 enacted level and \$1.6 billion above the president's budget.

NSF: \$8.1 billion, \$307.6 million above the FY2018 enacted level and \$603 million above the president's budget.

Agricultural Research: \$3.16 billion, an increase of \$405 million above the FY2018 enacted level and \$879 million above the president's request, to support the Agricultural Research Service and the National Institute of Food and Agriculture.

NIST: Reduced to \$985.5 million, maintaining FY 2018 levels for Scientific and Technical Research and Services, which supports cybersecurity, advanced manufacturing, quantum science, and centers of excellence, among other programs.

Homeland Security S&T: \$820 million, down \$12 million from FY 2018 but \$236 million above the White House request. Research, Development, and Innovation and University Programs are about the same as now.

A summary of the consolidated appropriations act is posted on the website <https://appropriations.house.gov/sites/democrats.appropriations.house.gov/files/documents/Summary%20of%20Conference%20Report.pdf>

**Doe Seeks to Curb Foreign 'Talent Recruitment':** Foreign governments target "individuals who are leaders in their respective fields and have top-level access to and research capabilities in technological fields of interest to the foreign government. As an incentive, potential recruits are offered lucrative and prestigious positions at premier foreign research institutes, labs, or universities," says a [memorandum from Deputy Energy Secretary Dan Brouillette](#). The memo goes on to prohibit Department of Energy employees from participating "in foreign talent recruitment programs of countries determined sensitive by DOE while employed by DOE, or performing work within the scope of a DOE contract. These limitations also will apply to recipients of financial assistance (e.g., grants or cooperative agreements)." The American Institute of Physics' [FYI Bulletin reports](#): "Although the memo does not mention any country specifically, U.S. intelligence officials have asserted the Chinese government uses the various recruitment programs it operates to appropriate research and intellectual property from the U.S."

**HIGH-LEVEL MEDICAL RESEARCH:** Two Engineering divisions at the National Science Foundation "are partnering with the Center for the Advancement of Science in Space (CASIS) to solicit research projects in the general fields of tissue engineering and mechanobiology that can utilize the International Space Station (ISS) National Lab to conduct research that will benefit life on Earth. U.S. entities including academic investigators, non-profit independent research laboratories and academic-commercial teams are eligible to apply." [See the solicitation.](#) <https://www.nsf.gov/pubs/2019/nsf19509/nsf19509.htm>

**KEEPING UP WITH CYBER:** NSF's Cyberinfrastructure for Sustained Scientific Innovation (CSSI) umbrella program "seeks to enable funding opportunities that are flexible and responsive to the evolving and emerging needs in cyberinfrastructure. (It emphasizes) integrated cyberinfrastructure services, quantitative metrics with targets for delivery and usage of these services, and community creation." Please see the CSSI RFP information in the Grant Opportunities section below.

**FIVE TOPICS OF THE DATA REVOLUTION:** NSF's Harnessing the Data Revolution (HDR) Big Idea "is realized through an interrelated set of efforts in: foundations of data science; algorithms and systems for data science; data-intensive science and engineering; data cyberinfrastructure; and education and workforce development. Please see the HDR RFP information in the Grant Opportunities section below.

**A BONUS FOR ETHICS:** NSF's Computing in Undergraduate Education (IUSE: CUE) program "will support teams of Institutions of Higher Education (IHEs) in re-envisioning the role of computing in interdisciplinary collaboration within their institutions. In addition, NSF will encourage partnering IHEs to use this opportunity to integrate the study of ethics into their curricula, both within core CS courses and across the relevant interdisciplinary application areas. . . . Proposals that do not include an ethics component may request a maximum budget of \$300,000 over 18 months; and proposals that do include an ethics component may request a maximum budget of \$350,000 over 18

months." [Learn more](#). Please see the IUSE RFP information in the Grant Opportunities section below.

**Worldwide Threat Assessment Report from US Intelligence Emphasizes on Research in AI, Biotech, Communications, Materials and Manufacturing:** The intelligence community's [Worldwide Threat Assessment](#) says U.S. adversaries are "investing heavily" in artificial intelligence, communication technologies, biotechnology, and materials sciences. "AI-enhanced systems are likely to be trusted with increasing levels of autonomy and decision making, presenting the world with a host of economic, military, ethical, and privacy challenges. Furthermore, interactions between multiple advanced AI systems could lead to unexpected outcomes that increase the risk of economic miscalculation or battlefield surprise. . . . Rapid advances in biotechnology, including gene editing, synthetic biology, and neuroscience, . . . introduce risks, such as the potential for adversaries to develop novel biological warfare agents, threaten food security, and enhance or degrade human performance."

**Artificial Intelligence and Autonomy:** The global race to develop artificial intelligence (AI)—systems that imitate aspects of human cognition—is likely to accelerate the development of highly capable, application-specific AI systems with national security implications. As academia, major companies, and large government programs continue to develop and deploy AI capabilities, AI-enhanced systems are likely to be trusted with increasing levels of autonomy and decision making, presenting the world with a host of economic, military, ethical, and 16 privacy challenges. Furthermore, interactions between multiple advanced AI systems could lead to unexpected outcomes that increase the risk of economic miscalculation or battlefield surprise.

**Information and Communications:** Foreign production and adoption of advanced communication technologies, such as fifth-generation (5G) wireless networks, most likely will challenge US competitiveness and data security, while advances in quantum computing foreshadow challenges to current methods of protecting data and transactions. US data will increasingly flow across foreign-produced equipment and foreign-controlled networks, raising the risk of foreign access and denial of service. Foreign deployment of a large-scale quantum computer, even 10 or more years in the future, would put sensitive information encrypted with today's most widely used algorithms at greatly increased risk of decryption.

**Biotechnology:** Rapid advances in biotechnology, including gene editing, synthetic biology, and neuroscience, are likely to present new economic, military, ethical, and regulatory challenges worldwide as governments struggle to keep pace. These technologies hold great promise for advances in precision medicine, agriculture, and manufacturing, but they also introduce risks, such as the potential for adversaries to develop novel biological warfare agents, threaten food security, and enhance or degrade human performance.

**Materials and Manufacturing:** A global resurgence in materials science and manufacturing technology is likely to enable advanced states to create materials with novel properties and engineer structures not previously possible, while placing highend manufacturing capabilities within reach of small groups and individuals. These developments are already supplementing or displacing traditional methods in most areas of manufacturing, from complex rocket-engine components to plastic desktop-printed toys, and they are enabling the development of a new generation of engineered materials that combine different materials in complex geometries to alter the overall material properties. Full report is posted on the website <https://www.dni.gov/files/ODNI/documents/2019-ATA-SFR---SSCI.pdf>



## Webinar and Events

### **Event: NSF Scholarships in Science, Technology, Engineering, and Mathematics Webinars**

**Sponsor: NSF**

**When: February 19 and February 20, 2019; 1:00 PM – 2.30 PM**

**Website:** [https://www.nsf.gov/events/event\\_summ.jsp?cntn\\_id=244322&org=NSF](https://www.nsf.gov/events/event_summ.jsp?cntn_id=244322&org=NSF)

**Brief Description:** Submissions to the NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) Program are due by 5:00 p.m. local time Wednesday, 27 March 2019 in response to NSF solicitation 17-527. To answer any questions you may have about your potential submission, NSF S-STEM Program Directors will host a series of webinars in February. Please note that the webinars will be given in two styles: traditional and flipped. The first half-hour of a traditional webinar will consist of an overview of the program itself; this will be followed by a question-and-answer session. The entirety of a flipped webinar will be devoted to questions--the hosts of a flipped webinar will not give an overview of the program. To prepare for the flipped webinar, participants will be expected to have carefully read the solicitation ([click here](#)) and/or viewed the videos (bottom of this page) which have been updated.

**To join the webinar:**

**Register in Advance at**

**URL:** <https://nsf2.webex.com/nsf2/onstage/g.php?MTID=edd9e4ae91e00f9df4f30c58d1cb9923f>

**Event Number: 904 382 223**

**Event Password: S-Stem2019.**

### **Event: Cyberinfrastructure for Sustained Scientific Innovation (CSSI) Program Webinar**

**Sponsor: NSF**

**When: February 21, 2019; 2:00 PM – 3.00 PM**

**Website:** [https://www.nsf.gov/events/event\\_summ.jsp?cntn\\_id=297731&org=NSF](https://www.nsf.gov/events/event_summ.jsp?cntn_id=297731&org=NSF)

**Brief Description:** The Cyberinfrastructure for Sustained Scientific Innovation (CSSI) umbrella program seeks to enable funding opportunities that are flexible and responsive to the evolving and emerging needs in cyberinfrastructure. This program continues the CSSI program by removing the distinction between *software* and *data* elements/framework implementations, and instead emphasizing integrated cyberinfrastructure services, quantitative metrics with targets for delivery and usage of these services, and community creation.

The CSSI umbrella program anticipates four classes of awards:

- **Elements:** These awards target small groups that will create and deploy robust services for which there is a demonstrated need that will advance one or more significant areas of science and engineering.
- **Framework Implementations:** These awards target larger, interdisciplinary teams organized around the development and application of common services aimed at solving common research problems faced by NSF researchers in one or more areas of science and engineering, resulting in a sustainable community framework providing Cyberinfrastructure (CI) services to a diverse community or communities.
- **Planning Grants for Community Cyberinfrastructure:** Planning awards focus on the establishment of long-term cyberinfrastructure services, which would serve a research community of substantial size and disciplinary breadth.
- **Community Cyberinfrastructure Implementations:** These Community Software Cyberinfrastructure Implementations focus on the establishment of long-term hubs of excellence in cyberinfrastructure services, which will serve a research community of substantial size and disciplinary breadth.

**To join the webinar:** Please register for the webinar

at: <https://nsf2.webex.com/nsf2/onstage/g.php?MTID=e0332a75e932457ad6aa3a7b27d780ebd> by Midnight on Wednesday February 20, 2018 to ensure your registration is processed.

**Event: Ensuring Success of Point-of-Care Technologies with a Systems Engineering Approach**

**Sponsor:** NIH POCTRN

**When:** February 26, 2019 • **Time:** 2:00 p.m. EST

**Website:** <https://www.poctrn.org/web/forms/shared/-/form/641982>

**Brief Description:** Medical technologies do not exist in isolation. In order for them to be successful, they need to operate as part of a larger care system. We invite you to join us for a webinar on how a Systems Engineering approach to developing disruptive point-of-care technologies can help overcome the many barriers to successful clinical adoption.

This webinar is designed by the [NIH Point-of-Care Technology Research Network](#)(POCTRN) to provide relevant information to stakeholders interested in point-of-care technology research and development. [POCTRN's goal](#) is to develop technologies with clinical applications using a network model that enhances complementary strengths and builds multidisciplinary partnerships.

Learn more about [POCTRN Funding Opportunities](#).

**To join the webinar:** Please register on the above URL.

**Event: Future of Work at the Human-Technology Frontier Live Q&A**

**Sponsor:** NSF

**When:** February 14, 2019; 12:00 PM – 2.00 PM

**Website:** [https://www.nsf.gov/events/event\\_summ.jsp?cntn\\_id=297648&org=NSF](https://www.nsf.gov/events/event_summ.jsp?cntn_id=297648&org=NSF)

**Brief Description:** Join NSF program officers for the **Future of Work at the Human-Technology Frontier (FW-HTF)** in a live Question and Answer session.

The Future of Work at the Human-Technology Frontier is one of [NSF's 10 Big Ideas](#) for future investments.

**Prepare for the Session**

Please thoroughly review the following materials:

- [Future of Work at the Human-Technology Frontier \(NSF 19-541\) program solicitation](#)
- FW-HTF [webinar slides](#) and [transcript](#)

**To join the webinar:** Please join us through the web or by phone:

**WebEx**

**URL:** <https://nsf2.webex.com/nsf2/onstage/g.php?MTID=e08926dc2f32aa17b10dba43604f71358>

**Event number:** 907 446 905

**Event password:** FW-htf2019

**Event: NSF Distinguished Lecture Series in Mathematical and Physical Sciences**

**Sponsor:** NSF

**When:** March 25, 2019 from 2.00 PM

**Website:** [http://sites.nationalacademies.org/deps/bmsa/deps\\_183972](http://sites.nationalacademies.org/deps/bmsa/deps_183972)

**Brief Description:**

March 25, 2019, 2:00 p.m., Room E2020

*"Cosmic Collisions, Gravitational Waves, and the Promise of Multi-Messenger Astrophysics"*

Prof. Vicky Kalogera (Northwestern University)

April 15, 2019, 2:00 p.m., Room E3410

*"Life Crystals"*

Prof. Pupa Gilbert (University of Wisconsin)

May 20, 2019, 2:00 p.m., Room E2020

*"Quantum Chemistry: Present and Future Directions"*

Prof. Garnet Chan (California Institute of Technology)

**To join the webinar:** All Distinguished Lectures in Mathematical and Physical Sciences from 2014 through 2017 can be viewed on the web (please [click here](#)).

## Grant Opportunities

### National Science Foundation

#### **Grant Program: Faculty Development in the Space Sciences**

**Agency: National Science Foundation NSF 19-558**

**RFP Website:** <https://www.nsf.gov/pubs/2019/nsf19558/nsf19558.htm>

**Brief Description:** The Geospace Section of the Division of Atmospheric and Geospace Sciences is pleased to offer awards for the creation of new tenure-track faculty positions within the intellectual disciplines which comprise the space sciences to ensure the health and vitality of solar and space sciences on university teaching faculties. The aim of these awards is to integrate research topics in solar and space physics into basic physics, astronomy, electrical engineering, geoscience, meteorology, computer science, and applied mathematics programs, and to develop space physics graduate programs capable of training the next generation of leaders in this field. Space Science is interdisciplinary in nature and the Faculty Development in the Space Sciences awardees will be expected to establish partnerships within the university community. NSF funding will support the entire academic year salary and benefits of the newly recruited tenure-track faculty member for a duration of up to five years with a total award amount not to exceed \$1,500,000.

**Awards:** Continuing Grants. Anticipated Funding: \$4,500,000.

**Letter of Intent:** Not required

**Proposal Submission Deadline:** May 24, 2019

**Contacts:** S. Irfan Azeem, telephone: (703) 292-8518, email: [sazeem@nsf.gov](mailto:sazeem@nsf.gov)

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#### **Grant Program: EHR Core Research: Production Engineering Education and Research (ECR: PEER)**

**Agency: National Science Foundation NSF 19-557**

**RFP Website:** <https://www.nsf.gov/pubs/2019/nsf19557/nsf19557.htm>

**Brief Description:** The National Science Foundation (NSF) and The Boeing Company are supporting a new initiative, managed and administered by NSF through its EHR Core Research (ECR) program, to accelerate training in critical skill areas for the Nation's engineering and advanced manufacturing workforce. The *EHR Core Research: Production Engineering Education and Research* (ECR: PEER) initiative supports foundational research arising from the design, development, and deployment of creative online curricula that provide learners at various levels with skills in five focal areas: model-based systems engineering, software engineering, mechatronics, data science, and artificial intelligence. ECR: PEER invites proposals to design, develop, deploy, and study the effectiveness of online courses in any one of these focal areas using the theories and tools of the learning sciences. Proposals for these ECR: PEER *Course, Curriculum, and Evaluation* projects may request a maximum of \$2,000,000 support for a duration of up to three years.

Additionally, ECR: PEER welcomes proposals to convene experts in the academic, for-profit, and non-profit sectors to imagine the future of production engineering education for one of the five focal areas. Proposals for these ECR: PEER *Workforce Development Workshops* may request a maximum of \$100,000 support for a duration of up to one year.

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

**Letter of Intent:** Not required

**Proposal Submission Deadline:** May 15, 2019

**Contacts:** Radhakishan Baheti, telephone: (703) 292-8339, email: [rbaheti@nsf.gov](mailto:rbaheti@nsf.gov)

- John C. Cherniavsky, telephone: (703) 292-5136, email: [jchernia@nsf.gov](mailto:jchernia@nsf.gov)
  - David L. Haury, telephone: (703) 292-8614, email: [dhaury@nsf.gov](mailto:dhaury@nsf.gov)
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**Grant Program: Signals in the Soil (SitS)****Agency: National Science Foundation NSF 19-556****RFP Website:** <https://www.nsf.gov/pubs/2019/nsf19556/nsf19556.htm>

**Brief Description:** The National Science Foundation (NSF) Directorates for Engineering (ENG) and Geosciences (GEO), the Division of Integrative Organismal Systems in the Directorate for Biological Sciences (BIO/IOS), and the Division of Computer and Network Systems in the Directorate Computer and Information Science and Engineering (CISE/CNS), in collaboration with the US Department of Agriculture National Institute of Food and Agriculture (USDA NIFA) and the Natural Environment Research Council (NERC), the Engineering and Physical Sciences Research Council (EPSRC), the Biotechnology and Biological Sciences Research Council (BBSRC), and the Science and Technology Facilities Council (STFC) of United Kingdom Research and Innovation (UKRI) encourage convergent research that transforms existing capabilities in understanding dynamic, near-surface soil processes through advances in sensor systems and modeling. To accomplish this research, multiple disciplines must converge to produce novel sensors and/or sensing systems of multiple modalities that are adaptable to different environments and collect data and report on a wide range of chemical, biological and physical parameters. This type of approach will also be necessary to develop next generation soil models, wireless communication and cyber systems capabilities, and to grow a scientific community that is able to address complex problems through education and outreach. This program fosters collaboration among the partner agencies and the researchers they support by combining resources and funding for the most innovative and high-impact projects that address their respective missions.

**Awards:** Standard Grants. Anticipated Funding: \$5,600,000.**Letter of Intent:** Not required**Proposal Submission Deadline:** May 15, 2019**Contacts:** Brandi L. Schottel, National Science Foundation Directorate for Engineering / Division of Chemical, Bioengineering, Environmental, and Transport Systems, telephone: (703) 292-4798, email: [bschotte@nsf.gov](mailto:bschotte@nsf.gov)James W. Jones, National Science Foundation Directorate for Engineering / Division of Chemical, Bioengineering, Environmental, and Transport Systems, telephone: (703) 292-4458, email: [jwjones@nsf.gov](mailto:jwjones@nsf.gov)**Grant Program: Cyber-Physical Systems (CPS)****Agency: National Science Foundation NSF 19-553****RFP Website:** <https://www.nsf.gov/pubs/2019/nsf19553/nsf19553.htm>

**Brief Description:** Cyber-physical systems (CPS) are engineered systems that are built from, and depend upon, the seamless integration of computation and physical components. Advances in CPS will enable capability, adaptability, scalability, resiliency, safety, security, and usability that will expand the horizons of these critical systems. CPS technologies are transforming the way people interact with engineered systems, just as the Internet has transformed the way people interact with information. New, smart CPS drive innovation and competition in a range of application domains including agriculture, aeronautics, building design, civil infrastructure, energy, environmental quality, healthcare and personalized medicine, manufacturing, and transportation. Moreover, the integration of artificial intelligence with CPS creates new research opportunities with major societal implications.

While tremendous progress has been made in advancing CPS technologies, the demand for innovation across application domains is driving the need to accelerate fundamental research to keep pace. At the same time, the CPS program seeks to open new vistas for the research community to think beyond the usual cyber-physical paradigms and structures and propose creative ideas to address the myriad challenges of today's systems as well as those of the future that have not yet been designed or fielded.

The CPS program aims to develop the core research needed to engineer these complex CPS, some of which may also require dependable, high-confidence, or provable behaviors. Core research areas of the

program include control, data analytics, autonomy, design, information management, internet of things (IoT), mixed initiatives including human-in- or on-the-loop, networking, privacy, real-time systems, safety, security, and verification. By abstracting from the particulars of specific systems and application domains, the CPS program seeks to reveal cross-cutting, fundamental scientific and engineering principles that underpin the integration of cyber and physical elements across all application domains. The program additionally supports the development of methods, tools, and hardware and software components based upon these cross-cutting principles, along with validation of the principles via prototypes and testbeds. This program also fosters a research community that is committed to advancing education and outreach in CPS and accelerating the transition of CPS research into the real world.

**Awards:** Standard Grants. Anticipated Funding: \$51,500,000.

**Letter of Intent:** Not required

**Proposal Submission Deadline:**

April 01, 2019 - April 12, 2019: Small and Medium

September 12, 2019 - September 26, 2019: Frontier

**Contacts:** David Corman, Program Director, CISE/CNS, telephone: (703) 292-8754, email: [dcorman@nsf.gov](mailto:dcorman@nsf.gov)

- Radhakisan Baheti, Program Director, ENG/ECCS, telephone: (703) 292-8339, email: [rbaheti@nsf.gov](mailto:rbaheti@nsf.gov)

- Anindya Banerjee, Program Director CISE /CCF, telephone: (703) 292-7885, email: [abanerje@nsf.gov](mailto:abanerje@nsf.gov)

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**Grant Program: ADVANCE: Organizational Change for Gender Equity in STEM Academic Professions (ADVANCE)**

**Agency: National Science Foundation NSF 19-552**

**RFP Website:** <https://www.nsf.gov/pubs/2019/nsf19552/nsf19552.htm>

**Brief Description:** The NSF ADVANCE program contributes to the National Science Foundation's goal of a more diverse and capable science and engineering workforce.<sup>1</sup> In this solicitation, the NSF ADVANCE program seeks to build on prior NSF ADVANCE work and other research and literature concerning gender, racial, and ethnic equity. The NSF ADVANCE program goal is to broaden the implementation of evidence-based systemic change strategies that promote equity for STEM<sup>2</sup> faculty in academic workplaces and the academic profession. The NSF ADVANCE program provides grants to enhance the systemic factors that support equity and inclusion and to mitigate the systemic factors that create inequities in the academic profession and workplaces. Systemic (or organizational) inequities may exist in areas such as policy and practice as well as in organizational culture and climate. For example, practices in academic departments that result in the inequitable allocation of service or teaching assignments may impede research productivity, delay advancement, and create a culture of differential treatment and rewards. Similarly, policies and procedures that do not mitigate implicit bias in hiring, tenure, and promotion decisions could lead to women and racial and ethnic minorities being evaluated less favorably, perpetuating historical under-participation in STEM academic careers and contributing to an academic climate that is not inclusive.

All NSF ADVANCE proposals are expected to use intersectional approaches in the design of systemic change strategies for STEM faculty in recognition that gender, race and ethnicity do not exist in isolation from each other and from other categories of social identity. The solicitation includes four funding tracks *Institutional Transformation (IT)*, *Adaptation*, *Partnership*, and *Catalyst*, in support of the NSF ADVANCE program goal to broaden the implementation of systemic strategies that promote equity for STEM faculty.

**Please note that NSF ADVANCE does not provide fellowships, research, or travel grants to individual students, postdoctoral researchers, or faculty to pursue STEM degrees or research.** Undergraduate STEM opportunities can be found at [stemundergrads.science.gov](http://stemundergrads.science.gov) and graduate STEM opportunities at [stemgradstudents.science.gov](http://stemgradstudents.science.gov).

**Awards:** Standard Grants. Anticipated Funding: \$30,000,000.

**Letter of Intent:** Required

**Proposal Submission Deadline:**

**Letter of Intent Due Date(s) (required)** (due by 5 p.m. submitter's local time):

May 15, 2019

Letter of Intent due for May 2019 Adaptation and Partnership competition

November 01, 2019

Letter of Intent for January 2020 Adaptation and Partnership competition

**Preliminary Proposal Target Date(s) (required)** (due by 5 p.m. submitter's local time):

October 01, 2019

Target Date for IT-Preliminary proposals - preliminary proposals are only required for IHEs that want a chance to submit a full Institutional Transformation proposal

**Full Proposal Deadline(s)** (due by 5 p.m. submitter's local time):

May 22, 2019

Adaptation and Partnership (FY 2019 competition)

January 15, 2020

Adaptation and Partnership (FY 2020 competition)

**Full Proposal Target Date(s):**

June 03, 2019

Catalyst proposals

March 02, 2020

Institutional Transformation proposals - only IHEs invited as a result of an IT-Preliminary proposal may submit a full IT proposal

**Contacts:** Minerva Cordero, Program Director, telephone: (703) 292-7377, email: [ADVANCE@nsf.gov](mailto:ADVANCE@nsf.gov)

- Jessie DeAro, Program Officer, telephone: (703) 292-5350, email: [ADVANCE@nsf.gov](mailto:ADVANCE@nsf.gov)

## **Grant Program: Growing Convergence Research (GCR)**

**Agency:** National Science Foundation NSF 19-551

**RFP Website:** <https://www.nsf.gov/pubs/2019/nsf19551/nsf19551.htm>

**Brief Description: Growing Convergence Research (GCR)** at the National Science Foundation was identified as one of 10 Big Ideas. Convergence research is a means for solving vexing research problems, in particular, complex problems focusing on societal needs. It entails integrating knowledge, methods, and expertise from different disciplines and forming novel frameworks to catalyze scientific discovery and innovation.

GCR identifies [Convergence Research](#) as having two primary characteristics:

- *Research driven by a specific and compelling problem.* Convergence Research is generally inspired by the need to address a specific challenge or opportunity, whether it arises from deep scientific questions or pressing societal needs.
- *Deep integration across disciplines.* As experts from different disciplines pursue common research challenges, their knowledge, theories, methods, data, research communities and languages become increasingly intermingled or integrated. New frameworks, paradigms or even disciplines can form sustained interactions across multiple communities.

A distinct characteristic of convergence research, in contrast to other forms of multidisciplinary research, is that from the inception, the convergence paradigm *intentionally* brings together intellectually diverse researchers and stakeholders to frame the research questions, develop effective ways of communicating across disciplines and sectors, adopt common frameworks for their solution, and, when appropriate, develop a new scientific vocabulary. Research teams practicing convergence aim at developing sustainable relationships that may not only create solutions to the problem that engendered the collaboration, but also develop novel ways of framing related research questions and open new research vistas.

This GCR solicitation targets multi-disciplinary team research that crosses directorate or division boundaries and is currently not supported by NSF programs, initiatives and research-focused Big Ideas. Proposers must make a convincing case that the research to be conducted is within NSF's purview and cannot be supported by existing NSF programs and multidisciplinary initiatives. Proposals involving convergence in areas covered by existing programs and solicitations will be returned without review.

**Awards:** Cooperative Agreement. Anticipated Funding: \$12,000,000.

**Letter of Intent:** Not required

**Proposal Submission Deadline:** May 08, 2019

**Contacts:** Dragana Brzakovic, telephone: (703) 292-8040, email: [dbrzakov@nsf.gov](mailto:dbrzakov@nsf.gov)

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**Grant Program: Harnessing the Data Revolution (HDR): Transdisciplinary Research in Principles of Data Science Phase I (HDR TRIPODS Phase I)**

**Agency:** National Science Foundation NSF 19-550

**RFP Website:** <https://www.nsf.gov/pubs/2019/nsf19550/nsf19550.htm>

**Brief Description:** NSF's *Harnessing the Data Revolution (HDR) Big Idea* is a national-scale activity to enable new modes of data-driven discovery that will allow fundamental questions to be asked and answered at the frontiers of science and engineering. Through this NSF-wide activity, HDR will generate new knowledge and understanding, and accelerate discovery and innovation. The HDR vision is realized through an interrelated set of efforts in:

- Foundations of data science;
- Algorithms and systems for data science;
- Data-intensive science and engineering;
- Data cyberinfrastructure; and
- Education and workforce development.

Each of these efforts is designed to amplify the intrinsically multidisciplinary nature of the emerging field of data science. The HDR Big Idea will establish theoretical, technical, and ethical frameworks that will be applied to tackle data-intensive problems in science and engineering, contributing to data-driven decision-making that impacts society.

*Harnessing the Data Revolution: Transdisciplinary Research In Principles Of Data Science* (HDR TRIPODS) aims to bring together the electrical engineering, mathematics, statistics, and theoretical computer science communities to develop the theoretical foundations of data science through integrated research and training activities. Phase I, described in this solicitation, will support the development of small collaborative Institutes. Phase II (to be described in an anticipated future solicitation, subject to availability of funds) will support a smaller number of larger Institutes, selected from the Phase I Institutes via a second competitive proposal process. All HDR TRIPODS Institutes must involve significant and integral participation by researchers representing at least three of the four aforementioned communities. Please note that the ordering of the four communities is alphabetical and is not meant to emphasize any one discipline over another.

**Awards:** Continuing Grant. Anticipated Funding: \$22,000,000.

**Letter of Intent:** Required

**Proposal Submission Deadline:**

- **Letter of Intent Due Date(s) (required)** (due by 5 p.m. submitter's local time):  
March 25, 2019
- **Submission Window Date(s)** (due by 5 p.m. submitter's local time):  
April 24, 2019 - May 08, 2019

**Contacts:** Nandini Kannan, Program Director, Division of Mathematical Sciences, telephone: (703) 292-8104, email: [nakannan@nsf.gov](mailto:nakannan@nsf.gov)

- Tracy Kimbrel, Program Director, Division of Computing and Communication Foundations, telephone: (703) 292-7924, email: [tkimbrel@nsf.gov](mailto:tkimbrel@nsf.gov)

- Anthony Kuh, Program Director, Division of Electrical, Communications, and Cyber Systems, telephone: (703) 292-2210, email: [akuh@nsf.gov](mailto:akuh@nsf.gov)
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**Grant Program: Harnessing the Data Revolution (HDR): Institutes for Data-Intensive Research in Science and Engineering - Frameworks (I-DIRSE-FW)**

**Agency: National Science Foundation NSF 19-549**

**RFP Website:**

[https://www.nsf.gov/pubs/2019/nsf19549/nsf19549.htm?WT.mc\\_id=USNSF\\_25&WT.mc\\_ev=click](https://www.nsf.gov/pubs/2019/nsf19549/nsf19549.htm?WT.mc_id=USNSF_25&WT.mc_ev=click)

**Brief Description:** NSF's *Harnessing the Data Revolution (HDR) Big Idea* is a national-scale activity to enable new modes of data-driven discovery that will allow fundamental questions to be asked and answered at the frontiers of science and engineering. Through this NSF-wide activity, HDR will generate new knowledge and understanding, and accelerate discovery and innovation. The HDR vision is realized through an interrelated set of efforts in:

- Foundations of data science;
- Algorithms and systems for data science;
- Data-intensive science and engineering;
- Data cyberinfrastructure; and
- Education and workforce development.

Each of these efforts is designed to amplify the intrinsically multidisciplinary nature of the emerging field of data science. The HDR Big Idea will establish theoretical, technical, and ethical frameworks that will be applied to tackle data-intensive problems in science and engineering, contributing to data-driven decision-making that impacts society.

**This solicitation is for Frameworks for Data-Intensive Research in Science and Engineering (DIRSE) as part of the HDR Institutes activity.** These Frameworks represent one path of a conceptualization phase aimed at developing Institutes as part of the NSF investment in the HDR Big Idea.

The HDR Institutes activity seeks to create an integrated fabric of interrelated institutes that can accelerate discovery and innovation in multiple areas of data-intensive science and engineering. The HDR Institutes will achieve this by harnessing diverse data sources and developing and applying new methodologies, technologies, and infrastructure for data management and analysis. The HDR Institutes will support convergence between science and engineering research communities as well as expertise in data science foundations, systems, applications, and cyberinfrastructure. In addition, the HDR Institutes will enable breakthroughs in science and engineering through collaborative, co-designed programs to formulate innovative data-intensive approaches to address critical national challenges.

HDR Institutes will be developed through a two-phase process involving conceptualization followed by convergence. The conceptualization phase will be implemented in FY 2019 via two complementary funding opportunities. The first opportunity in FY 2019 will encourage individuals with compelling data-intensive science and engineering problems and/or technical expertise to self-organize into teams with the aim of developing innovative, collaborative research proposals through an Ideas Lab process. The second opportunity in FY 2019, described in this solicitation, will encourage applications from teams of researchers proposing frameworks for integrated sets of science and engineering problems and data science solutions. The conceptualization phase will result in two-year awards aimed at building communities, defining research priorities, and developing interdisciplinary prototype solutions. NSF anticipates implementing the subsequent convergence and co-design phase in the 2021 timeframe with awards that integrate and scale successful prototypes and new ideas into larger, more comprehensive HDR Institutes that bring together multiple science and engineering communities with computer and computational scientists, mathematicians, statisticians, and information scientists around common data science approaches.

The overarching goal of the HDR Institutes DIRSE Frameworks solicitation is to foster convergent approaches to data-driven research in science and engineering. Frameworks will consist of



interdisciplinary teams to conceptualize and pilot new modalities for collaboration and convergence that go beyond institutional walls and traditional disciplinary boundaries, to build innovative connections between scientific groups and data scientists and engineers, to integrate research infrastructure and education infrastructure. The Frameworks should focus on science and engineering areas that: (1) are at a "tipping point" where a timely investment in data-intensive approaches has the maximum potential for a transformative effect, (2) have needs that can benefit from interdisciplinary investments in data analytics infrastructure, and (3) represent investment priorities for the participating NSF directorates during, and beyond, the lifetime of the HDR Big Idea. Specific outcomes expected from the Frameworks include identification of frontier science and engineering challenge problems and the associated data and data-science barriers or tipping points, as well as development of new strategies and innovative approaches to foster scientific breakthroughs involving researchers from diverse scientific backgrounds.

**Awards:** Standard Grants. Anticipated Funding: \$21,000,000.

**Letter of Intent:** Not required

**Proposal Submission Deadline:** May 07, 2019

**Contacts:** Amy Walton, telephone: (703) 292-4538, email: [HDR-DIRSE@nsf.gov](mailto:HDR-DIRSE@nsf.gov)

- Nandini Kannan, telephone: (703) 292-8104, email: [HDR-DIRSE@nsf.gov](mailto:HDR-DIRSE@nsf.gov)

- John C. Cherniavsky, telephone: (703) 292-5136, email: [HDR-DIRSE@nsf.gov](mailto:HDR-DIRSE@nsf.gov)

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## **Grant Program: Cyberinfrastructure for Sustained Scientific Innovation (CSSI): Elements and Framework Implementations**

**Agency:** National Science Foundation NSF 19-548

**RFP Website:** <https://www.nsf.gov/pubs/2019/nsf19548/nsf19548.htm>

**Brief Description:** The Cyberinfrastructure for Sustained Scientific Innovation (CSSI) umbrella program seeks to enable funding opportunities that are flexible and responsive to the evolving and emerging needs in cyberinfrastructure. This program continues the CSSI program by removing the distinction between *software and data* elements/framework implementations, and instead emphasizing integrated cyberinfrastructure services, quantitative metrics with targets for delivery and usage of these services, and community creation.

The CSSI umbrella program anticipates four classes of awards:

- **Elements:** These awards target small groups that will create and deploy robust services for which there is a demonstrated need that will advance one or more significant areas of science and engineering.
- **Framework Implementations:** These awards target larger, interdisciplinary teams organized around the development and application of common services aimed at solving common research problems faced by NSF researchers in one or more areas of science and engineering, resulting in a sustainable community framework providing Cyberinfrastructure (CI) services to a diverse community or communities.
- **Planning Grants for Community Cyberinfrastructure:** Planning awards focus on the establishment of long-term cyberinfrastructure services, which would serve a research community of substantial size and disciplinary breadth.
- **Community Cyberinfrastructure Implementations:** These Community Software Cyberinfrastructure Implementations focus on the establishment of long-term hubs of excellence in cyberinfrastructure services, which will serve a research community of substantial size and disciplinary breadth.

**This particular CSSI solicitation requests only Elements and Framework Implementations classes of awards.**

**Awards:** Standard Grants. Anticipated Funding: \$46,000,000.

**Letter of Intent:** Not required

**Proposal Submission Deadline:** April 08, 2019; November 01, 2019

**Contacts:** Vipin Chaudhary, Program Director, CISE/OAC, telephone: (703) 292-2254, email: [CSSIQueries@nsf.gov](mailto:CSSIQueries@nsf.gov)

- Micah Beck, Program Director, CISE/OAC, telephone: (703) 292-2932, email: [CSSIQueries@nsf.gov](mailto:CSSIQueries@nsf.gov)
  - Amy Walton, Program Director, CISE/OAC, telephone: (703) 292-4538, email: [CSSIQueries@nsf.gov](mailto:CSSIQueries@nsf.gov)
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**Grant Program: A Science of Science Policy Approach to Analyzing and Innovating the Biomedical Research Enterprise (SCISIPBIO)**

**Agency: National Science Foundation NSF 19-547**

**RFP Website:** <https://www.nsf.gov/pubs/2019/nsf19547/nsf19547.htm>

**Brief Description:** NSF promotes the progress of science by maintaining the general health of research and education across all fields of science and engineering. The Social, Behavioral, and Economic Sciences (SBE) Directorate within the NSF supports basic research on people and society. The SBE sciences focus on human behavior and social organizations and how social, economic, political, cultural, and environmental forces affect the lives of people from birth to old age and how people in turn shape those forces. SBE's Science of Science and Innovation Policy (SciSIP) program supports research designed to advance the scientific basis of science and innovation policy.

The NIH is the U.S. Federal agency charged with supporting biomedical research in the U.S. The National Institute of General Medical Sciences (NIGMS) within the NIH supports basic biomedical research that increases understanding of biological processes and lays the foundation for advances in disease diagnosis, treatment, and prevention.

Both the NSF and NIH believe that there are opportunities and needs in building and supporting research projects with a focus on the scientific research enterprise. The two agencies also recognize that when programmatic goals are compatible, coordinated management and funding of a research program can have a positive synergistic effect on the level and scope of research and can leverage the investments of both agencies.

Therefore, NIGMS and SBE are partnering to enable collaboration in research between the SciSIP program and NIGMS. This partnership will result in a portfolio of high quality research to provide scientific analysis of important aspects of the biomedical research enterprise and efforts to foster a diverse, innovative, productive and efficient scientific workforce, from which future scientific leaders will emerge. Prospective investigators are strongly encouraged to discuss their proposals with the cognizant Program Officers before submission to determine project relevance to the priorities of both SBE and NIGMS. Specific questions pertaining to this solicitation can also be directed to the cognizant Program Officers.

**Awards:** Standard Grants. Anticipated Funding: \$2,000,000.

**Letter of Intent:** Not required

**Proposal Submission Deadline:** May 08, 2019

September 09, 2019

**Contacts:** Cassidy R. Sugimoto, NSF, telephone: (703) 292-7012, email: [csugimot@nsf.gov](mailto:csugimot@nsf.gov)

- Dorit Zuk, NIGMS, telephone: (301) 594-0943, email: [zukd@mail.nih.gov](mailto:zukd@mail.nih.gov)
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**Grant Program: Improving Undergraduate STEM Education: Computing in Undergraduate Education (IUSE: CUE)**

**Agency: National Science Foundation NSF 19-546**

**RFP Website:** <https://www.nsf.gov/pubs/2019/nsf19546/nsf19546.htm>

**Brief Description:** Increasingly, undergraduate computer science (CS) programs are being called upon to prepare larger and more diverse student populations for careers in both CS and non-CS fields, including careers in scientific and non-scientific disciplines. Many of these students aim to acquire the understandings and competencies needed to learn how to use computation collaboratively across different

contexts and challenging problems. However, standard CS course sequences do not always serve these students well. With this solicitation, NSF will support teams of Institutions of Higher Education (IHEs) in re-envisioning the role of computing in interdisciplinary collaboration within their institutions. In addition, NSF will encourage partnering IHEs to use this opportunity to integrate the study of ethics into their curricula, both within core CS courses and across the relevant interdisciplinary application areas.

**Awards:** Standard Grants. Anticipated Funding: \$4,500,000.

**Letter of Intent:** Not required

**Proposal Submission Deadline:** May 09, 2019

**Contacts:** Janice Cuny, Program Director, CISE, telephone: (703) 292-8900, email: [jcuny@nsf.gov](mailto:jcuny@nsf.gov)

- Fay Cobb Payton, Program Director, CISE/CNS, telephone: (703) 292-7939, email: [fpayton@nsf.gov](mailto:fpayton@nsf.gov)
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### **Grant Program: Distributed Array of Small Instruments (DASI)**

**Agency:** National Science Foundation NSF 19-545

**RFP Website:** <https://www.nsf.gov/pubs/2019/nsf19545/nsf19545.htm>

**Brief Description:** The Distributed Arrays of Small Instruments (DASI) solicitation is designed to address the increasing need for high spatial and temporal resolution measurements to determine the local, regional, and global scale processes that are essential for addressing the fundamental questions in solar and space physics. This solicitation will be formally divided into two tracks: 1) development of instrumentation for future deployment in arrays and 2) deployment and operation of existing instruments in distributed arrays. This DASI solicitation emphasizes both strong scientific merit and a well-developed plan for student training and involvement of a diverse workforce.

**Awards:** Standard Grants. Anticipated Funding: \$350,000.

**Letter of Intent:** Not required

**Proposal Submission Deadline:** April 19, 2019

**Contacts:** Carrie E. Black, telephone: (703) 292-2426, email: [cblack@nsf.gov](mailto:cblack@nsf.gov)

- S. Irfan Azeem, telephone: (703) 292-8521, email: [sazeem@nsf.gov](mailto:sazeem@nsf.gov)
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### **Grant Program: Harnessing the Data Revolution (HDR): Institutes for Data-Intensive Research in Science and Engineering - Ideas Labs (I-DIRSE-IL)**

**Agency:** National Science Foundation NSF 19-543

**RFP Website:** <https://www.nsf.gov/pubs/2019/nsf19543/nsf19543.htm>

**Brief Description:** NSF's *Harnessing the Data Revolution (HDR) Big Idea* is a national-scale activity to enable new modes of data-driven discovery that will allow fundamental questions to be asked and answered at the frontiers of science and engineering. Through this NSF-wide activity, HDR will generate new knowledge and understanding, and accelerate discovery and innovation. The HDR vision is realized through an interrelated set of efforts in:

- Foundations of data science;
- Algorithms and systems for data science;
- Data-intensive science and engineering;
- Data cyberinfrastructure; and
- Education and workforce development.

Each of these efforts is designed to amplify the intrinsically multidisciplinary nature of the emerging field of data science. The HDR Big Idea will establish theoretical, technical, and ethical frameworks that will be applied to tackle data-intensive problems in science and engineering, contributing to data-driven decision-making that impacts society.

**This solicitation describes one or more Ideas Lab(s) on Data-Intensive Research in Science and Engineering (DIRSE) as part of the HDR Institutes activity.** These Ideas Labs represent one path of a

conceptualization phase aimed at developing Institutes as part of the NSF investment in the HDR Big Idea.

The HDR Institutes activity seeks to create an integrated fabric of interrelated institutes that can accelerate discovery and innovation in multiple areas of data-intensive science and engineering. The HDR Institutes will achieve this by harnessing diverse data sources and developing and applying new methodologies, technologies, and infrastructure for data management and analysis. The HDR Institutes will support convergence between science and engineering research communities as well as expertise in data science foundations, systems, applications, and cyberinfrastructure. In addition, the HDR Institutes will enable breakthroughs in science and engineering through collaborative, co-designed programs to formulate innovative data-intensive approaches to address critical national challenges.

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

**Preliminary Proposal Due Date(s) (required) (due by 5 p.m. submitter's local time):**

**March 4, 2019 (revised date)**

**Proposal Submission Deadline:** June 19, 2019

**Contacts:** Nandini Kannan, MPS/DMS, telephone: (703) 292-8104, email: [nakannan@nsf.gov](mailto:nakannan@nsf.gov)

- Amy Walton, CISE/OAC, telephone: (703) 292-4538, email: [awalton@nsf.gov](mailto:awalton@nsf.gov)
  - Eva Zanzerkia, GEO/EAR, telephone: (703) 292-4734, email: [ezanzerk@nsf.gov](mailto:ezanzerk@nsf.gov)
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## **National Institutes of Health**

**Grant Program: Shared Instrumentation Grant (SIG) Program (S10 Clinical Trial Not Allowed)**

**Agency: National Institutes of Health PAR-19-179**

**RFP Website:** <https://grants.nih.gov/grants/guide/pa-files/PAR-19-179.html>

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

Types of supported instruments include, but are not limited to: X-ray diffractometers, mass spectrometers, nuclear magnetic resonance (NMR) spectrometers, DNA and protein sequencers, biosensors, electron and light microscopes, cell sorters, and biomedical imagers. Applications for "stand alone" computer systems (supercomputers, computer clusters and data storage systems) will only be considered if the system is solely dedicated to biomedical research.

All instruments, integrated systems, and computer systems must be dedicated to research only.

**Award:** Applications will be accepted that request a single, commercially available instrument or an integrated system. The minimum award is \$50,000 of direct costs. There is no upper limit on the cost of the instrument, but the maximum award is \$600,000 of direct costs. Since the cost of the various instruments will vary, it is anticipated that the amount of the award will also vary. S10 awards do not allow indirect costs.

**Letter of Intent:** Not required

**Deadline:** May 31, 2019, by 5:00 PM local time at the applicant organization. All types of applications allowed for this funding opportunity 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: Shared Instrumentation for Animal Research (SIFAR) Grant Program (S10 Clinical Trial Not Allowed)**

**Agency: National Institutes of Health PAR-19-178**

**RFP Website:** <https://grants.nih.gov/grants/guide/pa-files/PAR-19-178.html>

**Brief Description:** The Shared Instrumentation for Animal Research (SIFAR) Grant Program invites groups of NIH-funded investigators engaged in biomedical research using animals to seek support for high-cost, state-of-the art, commercially available scientific instruments. All requested instruments must be used on shared basis and enhance research that uses animals or related materials such as animal tissues, cells, or germplasm.

NIH-funded investigators use many different vertebrate and invertebrate animals in biomedical research, including worms, flies, fish, and rodents. This Funding Opportunity Announcement (FOA) supports instrumentation requests related to all animal species needed for NIH-supported biomedical research. NIH-funded investigators rely on a broad spectrum of technologies including nuclear magnetic resonance (NMR) spectrometers, mass spectrometers, DNA and protein sequencers, biosensors, electron and confocal microscopes, cell-sorters, and biomedical imagers. This FOA supports requests for all available technologies to enhance research using animals or related biological materials such as tissue, cells, or germplasm, for the ultimate benefit of human health.

Applicants may request clusters of instruments configured as specialized integrated systems or as a series of instruments to support a specific thematic area of biomedical research using animals. An integrated instrumentation system is one in which components, when used in conjunction with one other, perform a function that no single component could provide. A series of instruments may support a specialized workflow or provide synergetic functionalities to advance a thematic area of research. Any instrument, requested as a part of a cluster or a series, must be commercially available.

**Award:** Applications will be accepted for commercially available instruments only. At least one item of the requested instrumentation must cost at least \$50,000, after all applicable discounts. No instrument in a cluster can cost less than \$20,000, after all applicable discounts. There is no upper limit on the cost of each instrument, but the maximum award is \$750,000 of direct costs. Since the cost of the various instruments will vary, it is anticipated that the amount of the award will also vary. S10 awards do not allow indirect costs.

**Letter of Intent:** Not required

**Deadline:** May 31, 2019, by 5:00 PM local time at the applicant organization. All types of applications allowed for this funding opportunity 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: High-End Instrumentation (HEI) Grant Program (S10 Clinical Trial Not Allowed)**

**Agency: National Institutes of Health PAR-19-177**

**RFP Website:** <https://grants.nih.gov/grants/guide/pa-files/PAR-19-177.html>

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

Types of supported instruments include, but are not limited to: X-ray diffractometers, mass and nuclear magnetic resonance (NMR) spectrometers, DNA and protein sequencers, biosensors, electron and light microscopes, cell sorters, and biomedical imagers. Applications for "stand alone" computer systems

(supercomputers, computer clusters and data storage systems) will only be considered if the instrument is solely dedicated to the research needs of NIH-supported investigators.

To facilitate the introduction of advanced cutting-edge instrumentation technologies providing new research capabilities to the biomedical field, a risk-return trade-off is allowed when certain classes of instruments or integrated systems are requested. Accordingly, the HEI program supports the acquisition of unique instruments or integrated systems developed by reliable commercial vendors, provided the instruments or all components of integrated systems are guaranteed by the manufacturer's one-year warranty. Due to the novelty of the technologies and the uniqueness of their implementation, specialized and technologically savvy groups of investigators will be qualified to lead the adoption of such instruments for biomedical research and the development of innovative biomedical applications. Therefore, if such novel instrument is requested, the applicant should demonstrate special technical expertise, merging physical and biological sciences. For integrated systems, the applicant must provide a detailed description about how the system will be put together and about technical expertise of the individual(s) who will be responsible for assembling of the system. The applicant must also provide a detailed description of training for the investigators listed in the application about the use of the novel technology to advance their research.

All instruments, integrated systems, and computer systems must be dedicated to research only.

**Award:** Applications will be accepted that request a single, commercially available instrument or integrated system. The minimum award is \$600,001 of direct costs. There is no upper limit on the cost of the instrument, but the maximum award is \$2,000,000 of direct costs. Since the cost of the various instruments will vary, it is anticipated that the size of the award will also vary. S10 awards do not allow indirect costs.

**Letter of Intent:** Not required

**Deadline:** May 31, 2019, by 5:00 PM local time at the applicant organization. All types of applications allowed for this funding opportunity 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: NHLBI Emerging Investigator Award (EIA) (R35 Clinical Trial Optional)**

**Agency: National Institutes of Health RFA-HL-20-012**

**RFP Website:** <https://grants.nih.gov/grants/guide/rfa-files/RFA-HL-20-012.html>

**Brief Description:** The purpose of the NHLBI Outstanding Investigator Award (OIA) is to promote scientific productivity and innovation by providing long-term support and increased flexibility to experienced Program Directors (PDs)/Principal Investigators (PIs) who are currently PDs/PIs on at least two NHLBI R01-equivalent awards and whose outstanding record of research demonstrate their ability to make major contributions to heart, lung, blood and sleep (HLBS) research. The NHLBI OIA is intended to support a research program, rather than a research project, by providing the primary and most likely sole source of NHLBI funding on individual grant awards.

This FOA is intended for established investigators who have the potential to conduct outstanding, innovative research. For this reason, eligibility is limited. Please refer to [Section III. Eligibility Information](#) for specific details.

It is anticipated that the NHLBI OIA will:

- Provide a stable funding environment, thereby improving productivity and facilitating ambitious, creative research;
- Increase scientific innovation by enabling flexibility in pursuing new research directions as they arise, since PDs/PIs will not be bound to specific aims proposed in advance of the studies;
- Reduce the time researchers spend writing grant applications and managing multiple grant awards, thereby allowing more time to be devoted to conducting research;
- Facilitate PDs/PIs commitment to research through increased stability of funding; and

- Enable PDs/PIs to devote more time and energy to mentoring junior scientists and providing scientific service.

An NHLBI OIA is intended to be the primary, and in most cases, sole support for all of the NHLBI-related research conducted by an investigator. Research supported through the NHLBI OIA should be related to HLB research as described within the scope of the NHLBI mission (<http://www.nhlbi.nih.gov/about/org/mission>), sleep disorders closely-coupled to HLB outcomes, or basic sleep and circadian regulation. Within these bounds, investigators will have the freedom to explore new avenues of inquiry that arise during the course of their research. Work involving the addition of human subjects, vertebrate animals, stem cells, select agents, or a new foreign component requires prior approval of NHLBI staff according to existing policies and procedures.

**Award:** Applications may request up to \$600,000 direct costs per year. Investigators are encouraged to request what is well-justified for their research program. In general, the request should be commensurate with the PD/PI's recent NHLBI support.

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

**Deadline:** March 15, 2016; February 15, 2017; February 15, 2018, 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: Summer Research Education Experience Program (R25 Clinical Trial Not Allowed)**

**Agency:** National Institutes of Health PAR-19-164

**RFP Website:** <https://grants.nih.gov/grants/guide/pa-files/PAR-19-164.html>

**Brief Description:** The NIH Research Education Program (R25) supports research educational activities that complement other formal training programs in the mission areas of the NIH Institutes and Centers. The over-arching goals of the NIH R25 program are to: (1) complement and/or enhance the training of a workforce to meet the nation's biomedical, behavioral and clinical research needs; (2) encourage individuals from diverse backgrounds, including those from groups underrepresented in the biomedical and behavioral sciences, to pursue further studies or careers in research; (3) help recruit individuals with specific specialty or disciplinary backgrounds to research careers in biomedical, behavioral and clinical sciences; and (4) foster a better understanding of biomedical, behavioral and clinical research and its implications.

The over-arching goal of this R25 program is to support educational activities that foster a better understanding of biomedical, behavioral and clinical research and its implications. To accomplish the stated over-arching goal, this FOA will support creative educational activities with a primary focus on:

- **Research Experiences: Create educational activities** during the summer academic break. For example, for undergraduate students: to provide hands-on exposure to research, to reinforce their intent to graduate with a science degree, and/or to prepare them for graduate school admissions and/or careers in research; for high school and college science teachers: to enhance their science teaching.
- Support for science teachers at the K-12 and college level will be limited to those programs with a clear plan for how teachers will utilize their summer experience in their teaching during the school year.
- Applications that demonstrate the potential to impact students and teachers from diverse backgrounds are particularly encouraged.
- The proposed program needs to fit with the mission of the participating IC that the application is being submitted to and should not have a general STEM focus. For the

specific ICs, the following represents mission focus areas (more information can be found on the Table of IC-Specific Information and Contacts page):

- **NIAAA** broadly encourages research that focuses on the following 5 goals: (1) identifying the mechanism of; (2) improve diagnosis and tracking of; (3) develop and improve strategies to prevent; and (4) develop and improve treatments for alcohol misuse, alcohol use disorder and alcohol-related consequences; and (5) enhance the public health impact of NIAAA-supported research.
- **NIDA**. Four main goals outline the broad scope of NIDA's strategic objectives: (1) Identify the biological, environmental, behavioral, and social causes and consequences of drug use and addiction across the lifespan; (2) Develop new and improved strategies to prevent drug use and its consequences; (3) Develop new and improved treatments to help people with substance use disorders achieve and maintain a meaningful and sustained recovery; (4) Increase the public health impact of NIDA research and programs.
- **NIEHS** will support applications focusing on summer research experiences in the environmental health sciences. Applications to NIEHS should provide research experiences that address or seek to understand how exposures to toxic environmental insults impact health, alter biologic processes, are linked to disease initiation, progression or morbidity, or activities that lead to the development of prevention and intervention strategies to reduce environmentally induced diseases.
- **NINDS**. The National Institute of Neurological Disorders and Stroke (NINDS) will support applications focusing on summer research experiences that address or seek fundamental knowledge about the brain and nervous system by supporting and conducting research on the healthy and diseased brain, spinal cord, and peripheral nerves and to use that knowledge to reduce the burden of neurological disease. NINDS will support a maximum of two awards per institution (identified by a unique DUNS number): one focused on students and one focused on science teachers.

Research education programs may complement ongoing research training and education occurring at the applicant institution, but the proposed educational experiences must be distinct from those training and education programs currently receiving Federal support. R25 programs may augment institutional research training programs (e.g., T32, T90) but cannot be used to replace or circumvent Ruth L. Kirschstein National Research Service Award (NRSA) programs.

**Award:** Although the size of award may vary with the scope of the Summer Research Program proposed, budgets cannot exceed \$100,000 direct costs per year.

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

**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.

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## **Grant Program: Bioengineering Research Grants (BRG) (R01 Clinical Trial Not Allowed)**

**Agency:** National Institutes of Health PAR-19-158

**RFP Website:** <https://grants.nih.gov/grants/guide/pa-files/PAR-19-158.html>

**Brief Description:** Many major biomedical research problems are best addressed with a multidisciplinary approach that bridges the life and physical sciences. Principles and techniques in quantitative sciences such as physics, mathematics, chemistry, computer sciences, and engineering are increasingly applied to good effect in biomedical research. Bioengineering approaches integrate principles from diverse technical and biomedical fields, and the resulting multi-disciplinary research provides new understanding, innovative technologies, and new products that improve basic knowledge, human health, and quality of life. This FOA seeks to encourage collaborations of quantitative and physical scientists with biomedical researchers to catalyze the development of innovative bioengineering



approaches to the solution of important problems in biomedical research, clinical investigations, and medical practice.

Significant projects may include, but are not limited to: validation and translation of promising tools for prevention, monitoring or intervention; development of quantitative, predictive models of complex biological systems; integration and optimization of technologies that significantly increase sensitivity, specificity, positive predictive value, negative predictive value, efficiency, or throughput of measurements to address unsolved biological or medical questions; or engineering and testing of delivery systems, tissues, therapeutics, implants, and prosthetics that may improve treatment and healthcare. Innovation in this biomedical engineering FOA has a broad definition that includes development of new methods, ideas, or tools, integration of existing components into new combinations that deliver greater capabilities, new efficiencies, and/or greater effects. Overall impact of these advances may include reducing disparities in care, promoting wellness and independent living, increasing access to and utility of technologies to improve quality of life, reducing cost and complexity of procedures, and increasing throughput, sensitivity and specificity of diagnostic tests.

A project must clearly serve the mission of one or more of the NIH Institutes or Centers participating in this FOA. Investigators are encouraged to contact the designated [Scientific/Research contacts](#) for individual institute focus areas that will be supported. Applicants who seek to establish proof-of-concept are encouraged to respond to the Exploratory Bioengineering Research Grant (EBRG) FOA [<https://grants.nih.gov/grants/guide/pa-files/PA-18-286.html>]. Large team projects with a specific goal that can be addressed in 5-10 years are encouraged to respond to the Bioengineering Research Partnership (BRP) FOA [<https://grants.nih.gov/grants/guide/pa-files/PAR-18-208.html>].

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

**Letter of Intent:** Not Required

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

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

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## **Grant Program: Bioengineering Research Partnerships (U01 Clinical Trial Not Allowed)**

**Agency: National Institutes of Health PAR-19-156**

**RFP Website:** <https://grants.nih.gov/grants/guide/pa-files/PAR-19-156.html>

**Brief Description:** The primary objective of this FOA is to encourage basic, applied, or clinical bioengineering solutions to unmet needs in biological or biomedical research and clinical practice that can enhance the capabilities of end-users to improve our understanding of life science processes or the practice of medicine within 5 – 10 years. A BRP may bring together new or existing technologies to form creative solutions that have the potential to be widely adopted and improve human health. To deliver practical solutions within this timeframe, applicants are encouraged to use a design-directed research strategy with well-defined end goal(s) and intermediate, quantitative milestones. Goals may include, but are not limited to, establishing proof of concept, pre-commercial prototype production, licensure, release of software packages, designs or models, demonstrating the biological effectiveness of engineered constructs, elucidating the structural and functional relevance of biomolecules or tissues, first-in-human testing, or starting the investigational device exemption or investigational new drug process.

A second key objective is to encourage collaborations and partnerships among allied quantitative and biomedical disciplines. The value of strategic partnerships is well supported by the literature of both economics and science and technology policy, which documents greater success at research and development by groups that work in strategic alliances, often involving multiple institutions, compared to those working separately. In addition to the benefits to be derived from the research, the collaborations and partnerships can create opportunities for trans-disciplinary communication and training of a new generation of scientists who are capable of interacting across traditional technical boundaries. A Partnership typically consists of two to six partners from multiple institutions or multiple departments

from the same institution, with each partner bringing critical strengths to the project. The team may require experience in technology development, appropriate model systems for validation, human factors research, regulatory approval, project management or commercialization to realize and disseminate a robust solution. Potential beneficiaries should be active participants in the partnership from the beginning, to provide assurance that proposed solutions will meet community needs. Partnerships with companies that have relevant expertise or may eventually engage in future commercialization or with organizations that can test and disseminate technologies are encouraged under the BRP program. Each PD/PI or collaborator is expected to provide substantive contributions to the intellectual or technical aspects of the project, and should be clearly differentiated from team members who supply necessary but not unique components or services.

### **Scope of the Program**

Funding may be requested to develop, adapt, enhance, optimize, validate, or otherwise accelerate the adoption of promising bioengineering solutions, but not for support of commercial production or later stage (Phase II or Phase III) clinical trials. The approach used does not necessarily need to be extremely novel and may be based on integrating or scaling up existing technologies in untested ways. Overall impact of these new capabilities may include but is not limited to reducing disparities in care, providing new insight into basic biological processes, promoting wellness and independent living, engineering integrated biological and physical systems, increasing access to and usability of technologies to improve quality of life, reducing cost and complexity of high-demand tools, or increasing throughput sensitivity and specificity of laboratory and clinical studies. Innovation for this program is based on a coherent plan to deliver emerging or new capabilities to end users, including through combination of proven approaches and recognizing their resources, workflow, and skills. Developing a technology is expected to require innovation, but novelty in and of itself is not a requirement. For this FOA, it is innovative to deliver a new capability to solve an unmet need. Innovation in this case is heightened by a technology that can be easily adopted into routine practice and will give users, for example biomedical researchers, healthcare professionals, or citizens, new understanding, or will change health care practice.

Projects must clearly serve the mission of one or more of the NIH Institutes or Centers (ICs) participating in this FOA. Investigators are strongly encouraged to contact the Scientific/Research contacts identified in this FOA for individual IC policies, as well as feedback on the scope and relevance of the proposed project and guidance on the development of appropriate goals and milestones. Those investigators seeking to establish proof of concept are encouraged to respond to the EBRG FOA (PA-18-286). Investigators proposing smaller team projects, tackling problems that cannot be addressed within 5 – 10 years, or that have open-ended aims, are encouraged to respond to the BRG FOA (PAR-18-206).

**Award:** 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:** [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.

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## **Grant Program: Exploratory/Developmental Bioengineering Research Grants (EBRG) (R21 Clinical Trial Not Allowed)**

**Agency:** National Institutes of Health PAR-19-149

**RFP Website:** <https://grants.nih.gov/grants/guide/pa-files/PAR-19-149.html>

**Brief Description:** The evolution and vitality of the biomedical sciences require a constant infusion of new ideas, techniques, and points of view. These may improve established technologies or may differ substantially from current thinking or practice. They may or may not yet be supported by substantial preliminary data. Therefore, an EBRG may propose evaluation of an unproven approach for which there are minimal or no preliminary data.

This FOA encourages improvements to current art and/or new ideas that arise from applications of engineering's problem-solving approaches to model systems, tools, agents, targets, and technologies that would advance basic or applied biomedical research, clinical research, clinical care delivery, or accessibility.

Many major biomedical research problems are suitably addressed with a multidisciplinary approach that bridges the life and physical sciences. Principles and techniques in allied quantitative sciences such as engineering, physics, mathematics, chemistry, computer sciences, and informatics, among others, have been applied to good effect in serving the multitude of NIH missions. Bioengineering approaches to problem-solving draw from diverse technical and scientific fields. Multidisciplinary research results have provided improvements to existing capabilities, and contributed new basic and practical understanding, products, technologies, and methods that add knowledge and improve human health and quality of life.

### **Specific Research Objectives**

This FOA seeks to encourage quantitative and physical scientists to work with biomedical researchers to catalyze the use of bioengineering approaches for their potential to open new areas of biomedical investigation.

Although engineering applications submitted to the EBRG and other related announcements are often perceived as risky, experience shows that engineering training to anticipate errors, analyze what can go wrong, and to use both established and new principles to fix these issues do serve to manage most risks. The EBRG, more so than related bioengineering announcements for mid-level and final developmental and translational stages, does have the risks of feasibility tests, early development, and gathering of preliminary data. Program controls these acceptable risks by limiting total direct cost funds to \$275,000 divided across two years. Therefore, EBRG applicants are encouraged to explain the significance of the proposed work, why potential impact outweighs risks, anticipate difficulties and discuss possible workarounds. Projects may include but are not limited to assessing the feasibility of a novel tool for clinical intervention, exploring new approaches to characterizing and modeling complex biological systems, improving and integrating existing technologies to provide a breakthrough in unsolved biomedical problems, or establishing preliminary evidence for a new, perhaps transformative bioengineering approach that challenges accepted paradigms.

**Award:** The combined budget for direct costs for the two-year project period may not exceed \$275,000. No more than \$200,000 may be requested in any single year.

**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.

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### **Grant Program: Resources for Technology Dissemination (U24 Clinical Trial Not Allowed)**

**Agency:** National Institutes of Health RFA-EB-18-002

**RFP Website:** <https://grants.nih.gov/grants/guide/rfa-files/RFA-EB-18-002.html>

**Brief Description:** Technologies that accelerate the pace of biomedical research often exist in a single lab but could be of great benefit to other researchers if more broadly available. In many cases, technologies that have high value for the research enterprise do not have a viable commercialization path, and the originating laboratories have limited resources for their dissemination. The goal of this FOA is to facilitate non-commercial dissemination of cutting-edge, impactful imaging and biomedical engineering technologies from individual labs to the broader research community.

Technologies proposed for dissemination under this FOA should be highly relevant to one of the technology development [mission areas of NIBIB](#), including imaging or bioengineering devices, and biomedical software, methods, and imaging agents. Technologies should be novel and should have been prototyped and validated, ideally through peer-reviewed publications, and their high potential value to a

user base should be evident in the application. The intent of this FOA is to support lab-to-lab transfer of novel biomedical technologies for which a commercial dissemination route is not a feasible option. Projects should focus on transforming functioning prototypes into reliable, broadly usable tools and disseminating them to end users. This transformation could require minor technical improvements customized to meet end user's needs, but improvements should be within the scope of the prototyped technology and limited to applying proven techniques or existing resources. New technology development will not be supported under this FOA. Other allowable activities may include, but are not limited to, quality control and scale-up production necessary for beyond-the-lab dissemination, implementing methods on different hardware platforms, training for effective use of the technology, etc. Tool dissemination should begin no later than halfway into the project period.

The following are representative, but non-exclusive, examples of responsive applications:

- Provide unique electronic or optical units, systems, sub-systems or devices customized to fit the needs of a broad user base.
- Extend signal acquisition or image reconstruction methods across different hardware platforms.
- Design and develop interactive visualization interfaces, tutorials, and dissemination activities to broaden the use of computational models and analytical tools for multiple use cases.
- Provide diagnostic and therapeutic biomaterials, pre-cursors, or contrast agents to other research labs with instructions for optimal use.

Projects proposing development of novel or non-validated technologies are not responsive to this FOA, and applicants are encouraged to consider funding through other FOAs such as the NIH Research Project Grant Program ([R01](#)). Projects proposing activities directed toward commercialization are not responsive to this FOA, and applicants are encouraged to consider funding through the Small Business Innovation Research ([SBIR](#)) program or the Small Business Technology Transfer (STTR) program. Projects proposing the delivery of new technologies through academic-industry partnership are not responsive to this FOA, and applicants are encouraged to consider funding through the Bioengineering Research Partnership ([BRP](#)) program. Projects proposing clinical trials, service using existing equipment, or do not involve actual dissemination of technologies are not responsive to this FOA.

**Award:** Application budgets are limited to \$250,000 in direct costs in any project year.

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

**Deadline:** February 27, 2019, by 5:00 PM local time of applicant organization. All [types of non-AIDS applications](#) allowed for this funding opportunity announcement are due on 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: NIH Research Evaluation and Commercialization Hub (REACH) Awards (U01 Clinical Trial Not Allowed)**

**Agency: National Institutes of Health RFA-OD-19-014**

**RFP Website:** <https://grants.nih.gov/grants/guide/rfa-files/RFA-OD-19-014.html>

**Brief Description:** The REACH program will address the problems that hinder the critical, early steps necessary to translate novel scientific advances into commercially viable diagnostics, devices, therapeutics, and tools that improve patient care and improve public health. Applicants from the qualifying institutions are invited to submit grant applications to accelerate the transition of research discoveries into impactful products that address unmet medical needs.

Each Hub will assemble diverse experts in biomedical product development, and will have the expertise to identify and source projects that have progressed to a point where a potential commercial product can be envisioned, but additional research and development efforts are required to define the product (demonstrate feasibility and proof-of-concept). Through a combination of in-house efforts and collaboration, each Hub funded under this FOA will perform functions to specifically address the critical

knowledge and funding gaps that hinder the early steps needed to turn novel discoveries into technologies for biomedical advancement and patient care. The work supported by the REACH Hubs may include technical validation, market research, clarifying intellectual property position and strategy, clarifying regulatory or payer requirements, and investigating commercial or business opportunities.

Each Hub will:

- 1) Be governed by leadership experienced in biomedical product development with a specific focus on bringing biomedical technologies from research institutions to promising products that improve patient care and enhance health.
- 2) Develop the necessary collaborations and partnerships to meet the goals of this FOA.
- 3) Provide infrastructure and “know how” for soliciting, evaluating and selecting the most promising technology opportunities predicated on US disease burden medical need, scientific merit, and commercial potential that otherwise would not receive support for early-stage proof-of-concept work.
- 4) Establish processes to review and award funds to individual academic researchers and provide the resources and expertise required for early stage technology development.
- 5) Develop and implement market-focused project management oversight and decision-making processes.
- 6) Provide diverse academic innovators, including students and post-docs, access to skills development, hands-on entrepreneurial experience, educational and networking activities with linkages to local or virtual resources.
- 7) Implement a plan for transitioning to a self-sustaining structure.

Hub leadership must possess the necessary operational, business, and scientific expertise with a documented track record of success in transitioning technologies from the discovery phase to products that improve health. In addition, each Hub is required to demonstrate the core competencies necessary to fulfill the objectives of this FOA, including access to expertise in business development, market research, IP protection, regulatory and reimbursement processes, project management, pre-clinical studies, and appropriate domain experts. REACH will have the ability to support projects that cover various facets of technology development ranging from early stage laboratory-based technology feasibility or validation studies through pre-clinical testing. The successful REACH applicant will support the development of relevant technologies using a milestone-driven approach to transition technologies from the Hub to the next appropriate source of independent financing or strategic partner with the ultimate goal of commercialization.

**Award:** The maximum budget for a Hub is \$1,000,000 total costs per year. The maximum project period is 4 years.

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

**Deadline:** March 19, 2019 by 5:00 PM local time of applicant organization. All [types of non-AIDS applications](#) allowed for this funding opportunity announcement are due on 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: Biomedical Research Facilities (C06 Clinical Trial Not Allowed)**

**Agency: National Institutes of Health PAR-19-128**

**RFP Website:** <https://grants.nih.gov/grants/guide/pa-files/PAR-19-128.html>

**Brief Description:** NIH recognizes that modern physical infrastructure is necessary for the conduct of cutting-edge research. As science progresses and new technologies become available, dedicated space is required to house specialized equipment and to carry out novel experimental protocols. Projects will vary and depend on the present institutional infrastructure and long-term institutional research plans. Focusing on the advancement of science through the modernization of physical space will be a common and integral feature of all proposed projects. When completed, projects will have a significant institution-wide impact, bringing the research capacities and capabilities to a new level. An institution may request funds to modernize a core facility to create an environment required for research-driven specialized technological

services. Likewise, funds may be requested to consolidate space for an institution-wide core which would provide streamlined workflows for contemporary multi-disciplinary investigations. Modernizing laboratory space used on a shared basis to meet the growing needs consistent with an institutional strategic vision for biomedical research is another example of a suitable request. A successful project will serve research teams and a broad range of research efforts.

Various factors are typically considered when developing or modernizing research infrastructure. For applications submitted to this FOA, defined research needs will drive the requests for modern engineering solutions. As science progresses and new technologies become available, required dedicated space must comply with relevant technical specifications to provide a well-controlled environment, to enable novel experimental approaches, and to house specialized equipment.

Modern physical infrastructure requires the implementation of advanced engineering designs. Some protocols may be only conducted in designated clean rooms, such as barrier facilities for pathogen-free research or space for synthesis of compounds meeting standards for human subject experiments. Certain equipment requires specially shielded rooms. In some situations, the precision of experimental setups requires accurate monitoring of laboratory environmental conditions. The laboratory space also needs to be adequately maintained to serve its desired function over the years. The formal structure of an institutional core typically offers effective oversight to ensure that the required engineering standards of a space it occupies are met and maintained over time. Also, such centralized facilities are organized to provide rigorous scientific support for the conduct of research.

NIH recognizes the importance of all institutions of higher learning in contributing to the nation's research capacity. NIH intends to make available 25% of the funds to support projects from Institutions of Emerging Excellence (as defined in [42 USC 283k\(c\)\(2\)](#)). These institutions play a special role in advancing biomedical research as they leverage their research abilities to address problems of special relevance or unmet health needs. Often these institutions are located in the geographical areas in which deficits in research resources and health-related services/technologies may adversely affect health status of the population. Serving individuals from disadvantaged backgrounds by carrying activities related to training, health services, or biomedical research contributes to protecting health of such populations. Such institutions often serve as centers for dissemination of health information, training development, and advancement of research.

It is expected that all projects - both from research-intensive institutions and Institutions of Emerging Excellence - will have long-term effect and benefit the broad biomedical research community at the applicant institution by providing a modern research environment, accessible on a shared basis.

**Award:** Application budget is not limited but need to reflect the actual needs of the proposed project. The the maximum award budget is \$8,000,000. Applications with budget less than \$3,000,000 will not be considered. Since the scope of different projects will vary it is anticipated that the size of the awards will vary.

**Letter of Intent:** February 1, 2019

**Deadline:** March 4, 2019, by 5:00 PM local time of applicant organization..

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: Graduate Research Training Initiative for Student Enhancement (G-RISE) (T32)**

**Agency: National Institutes of Health PA-19-102**

**RFP Website:** <https://grants.nih.gov/grants/guide/pa-files/PAR-19-102.html>

**Brief Description:** The **Overarching Objective** of this Graduate Research Training Initiative for Student Enhancement program is to develop a diverse pool of well-trained Ph.D. biomedical scientists, who have the following technical, operational, and professional skills:

- A broad understanding across biomedical disciplines and the skills to independently acquire the knowledge needed to advance their chosen fields;

- The ability to think critically and independently, and to identify important biomedical research questions and approaches that push forward the boundaries of their areas of study;
- A strong foundation in scientific reasoning, rigorous research design, experimental methods, quantitative and computational approaches, and data analysis and interpretation;
- A commitment to approaching and conducting biomedical research responsibly, ethically, and with integrity;
- Experience initiating, conducting, interpreting, and presenting rigorous and reproducible biomedical research with increasing self-direction;
- The ability to work effectively in teams with colleagues from a variety of cultural and scientific backgrounds, and to promote inclusive and supportive scientific research environments;
- The skills to teach and communicate scientific research methodologies and findings to a wide variety of audiences (e.g., discipline-specific, across disciplines, and the public); and
- The knowledge, professional skills and experiences required to identify and transition into careers in the biomedical research workforce (i.e., the breadth of careers that sustain biomedical research in areas that are relevant to the NIH mission).

Diversity at all levels—from the kinds of science to the regions in which it is conducted to the backgrounds of the people conducting it—contributes to excellence in research training environments and strengthens the research enterprise. This FOA is intended to support outstanding research training programs that will enhance diversity at all levels. As part of a larger initiative to enhance diversity, the G-RISE program will support trainees earning a Ph.D. at research-active institutions.

### **Program Considerations**

NIGMS intends to fund applications that propose feasible academic and research focused training programs that will enhance diversity in the biomedical workforce. Applicants are expected to identify training objectives (i.e., specific, measurable, and obtainable outcomes the program intends to achieve) and to develop plans to implement evidence-based training and mentoring activities that are grounded in the literature and from evaluations of existing relevant programs. Program objectives must align with the overarching goal of the G-RISE diversity enhancing program. Funded programs are expected to provide evidence of accomplishing the training objectives in progress reports and upon renewal, to make training and career outcomes publicly available, and are strongly encouraged to disseminate successful training practices to the broader community.

Institutional commitment and support for the proposed training program are important elements of the application. The G-RISE program may complement and synergize with other ongoing federally-supported predoctoral research training programs at the applicant institution (e.g., in the development of skills needed for careers in the biomedical research workforce); however, the G-RISE program goals and activities to achieve those goals must be distinct from related programs currently receiving federal support at the same institution. In cases where an institution has multiple NIGMS training grants, it is expected that these programs will seek to create administrative efficiencies to reduce costs and improve trainee services and outcomes. The training grant should be well integrated within one or more department(s)/program(s) and should exert a strong, positive influence on the development and execution of the curriculum, training opportunities, and mentoring. Training grant funds may not be used solely as a vehicle to provide stipends for trainees to conduct research.

NIGMS does not accept applications for predoctoral T32 programs proposing only short-term research training (T35). Programs proposing short-term research training should apply to the Kirschstein-NRSA Short-Term Institutional Research Training Grant Program (T35) exclusively reserved for predoctoral, short-term research training (see [PA-18-404](#) and subsequent reissuances but note that NIGMS does not participate in that FOA). NIGMS will not accept applications proposing combined predoctoral and postdoctoral training under this FOA.

**Award:** Application budgets are not limited but need to reflect the actual needs of the proposed project. NIGMS expects to fund programs at or below 20 trainees, as appropriate to the institutional capabilities. The maximum project period is 5 years.

**Letter of Intent:** Not Required

**Deadline:** May 21, 2019; May 21, 2020; May 21, 2021, 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.

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**Grant Program: Limited Competition: Clinical and Translational Science Award (CTSA) Program: Exploratory Collaborative Innovation Awards (R21 Clinical Trial Optional)**

**Agency:** National Institutes of Health PAR-19-100

**RFP Website:** <https://grants.nih.gov/grants/guide/pa-files/PAR-19-100.html>

**Brief Description:** Translating biomedical discoveries into clinical applications is essential to improving human health. It is also a complex process with high costs and substantial failure rates. These failures can result in delays of years or decades before improved patient outcomes result from discoveries in biomedical research. Under NCATS' leadership, the CTSA Program supports a national consortium of medical research institutions — called hubs ? that work together to improve the translational research process to get more treatments to more patients more quickly. The hubs collaborate locally, regionally, and nationally to catalyze innovation in training, research tools and processes.

The overall purpose of the CTSA program is to deliver scientific and systems change that solve the many outstanding problems limiting the efficiency, effectiveness, and reach of clinical translational research, and thus get more treatments to more patients more quickly across the country. To do that, the program focuses on widely appreciated systematic barriers including (exemplary only; not intended to be exhaustive or exclusive):

- Data interoperability
- Biomarker qualification process
- Regulatory science
- Clinical trial networks
- Patient recruitment
- Electronic Health Records for research
- Harmonized IRBs
- Clinical diagnostic criteria
- Clinical outcome criteria (e.g., PROs)
- Adaptive clinical trial designs
- Shortening time of intervention adoption
- Methods to better measure impact on health (or lack thereof)
- Data transparency/release
- Integration of project management
- Incentives/credit for team science
- Incentives/credit for health improvements
- Education/Training (scientific and cultural)
- Collaborative structures

**Award:** Application budgets need to reflect the actual needs of the proposed project. The combined budget for direct costs for the two-year project period may not exceed \$275,000. No more than \$200,000 may be requested in any single year.

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

**Deadline:** March 8, 2019, July 11, 2019, November 9, 2019, March 8, 2020, July 11, 2020, November 9, 2020, March 8, 2021, July 11, 2021, November 9, 2021 , 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.

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**Grant Program: NIH Research Project Grant (Parent R01 Basic Experimental Studies with Humans Required)**

**Agency: National Institutes of Health PA-19-091**

**RFP Website:** <https://grants.nih.gov/grants/guide/pa-files/PA-19-091.html>

**Brief Description:** The NIH Research Project Grant (R01) supports a discrete, specified, circumscribed project in scientific areas that represent the investigators' specific interests and competencies and that fall within the mission of the participating NIH Institutes and Centers (ICs). The R01 is the original, and historically the oldest, grant mechanism used by the NIH to support health-related research and development.

Research grant applications are assigned to participating ICs based on receipt and referral guidelines, and many applications are assigned to multiple participating ICs with related research interests. Applicants are strongly encouraged to identify a participating IC that supports their area of research and contact Scientific/Research staff from relevant ICs to inquire about their interest in supporting the proposed research project. For specific information about the mission of each NIH IC, visit the [List of NIH Institutes, Centers, and Offices](#) website. All applications submitted to this Parent Funding Opportunity Announcement must propose basic science experimental studies involving humans, otherwise referred to in [NOT-OD-18-212](#) as "prospective basic science studies involving human participants," that fall within the NIH definition of a clinical trial and also meet the definition of basic research.

NIH defines basic research consistent with the definition of basic research in federal code, "the systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications towards processes or products in mind." ([32 CFR 272.3](#)).

NIH defines a clinical trial as "A research study in which one or more human subjects are prospectively assigned to one or more interventions (which may include placebo or other control) to evaluate the effects of those interventions on health-related biomedical or behavioral outcomes." ([NOT-OD-15-015](#)). Types of studies that should submit under this FOA include studies that prospectively assign human participants to conditions (i.e., experimentally manipulate independent variables) and that assess biomedical or behavioral outcomes in humans for the purpose of understanding the fundamental aspects of phenomena without specific application towards processes or products in mind.

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

**Letter of Intent:** Not Required

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

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

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**Grant Program: NIH Exploratory/Developmental Research Grant Program (Parent R21 Basic Experimental Studies with Humans Required)**

**Agency: National Institutes of Health PA-19-092**

**RFP Website:** <https://grants.nih.gov/grants/guide/pa-files/PA-19-092.html>

**Brief Description:** The evolution and vitality of the biomedical, behavioral, and clinical sciences require a constant infusion of new ideas, techniques, and points of view. These may differ substantially from current thinking or practice and may not yet be supported by substantial preliminary data. Through the NIH Exploratory/Developmental Research Grant Program, the NIH seeks to foster the introduction of novel scientific ideas, model systems, tools, agents, targets, and technologies that have the potential to substantially advance biomedical, behavioral, and clinical research.

This program is intended to encourage new exploratory and developmental research projects. For example, such projects could assess the feasibility of a novel area of investigation or a new experimental

system that has the potential to enhance health-related research. Another example could include the unique and innovative use of an existing methodology to explore a new scientific area. These studies may involve considerable risk but may lead to a breakthrough in a particular area, or to the development of novel techniques, agents, methodologies, models, or applications that could have a major impact on a field of biomedical, behavioral, or clinical research.

Applications for Exploratory/Developmental Research Grant awards should include projects distinct from those supported through the traditional R01 activity code. For example, long-term projects, or projects designed to increase knowledge in a well-established area, are not appropriate for this FOA. Applications submitted to this FOA should be exploratory and novel. These studies should break new ground or extend previous discoveries toward new directions or applications. Projects of limited cost or scope that use widely accepted approaches and methods within well-established fields are better suited for the [NIH Small Research Grant Program](#).

Applications are assigned to participating Institutes and Centers (ICs) based on receipt and referral guidelines and many applications are assigned to multiple participating ICs with related research interests. Applicants are encouraged to identify a participating IC that supports their area of research via the [R21 Basic Experimental Studies with Humans Required IC-Specific Scientific Interests and Contact website](#).

**Award:** The combined budget for direct costs for the two-year project period may not exceed \$275,000. No more than \$200,000 may be requested in any single year.

**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.

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### **Grant Program: NIH Research Project Grant (Parent R01 Clinical Trial Not Allowed)**

**Agency:** National Institutes of Health PA-19-056

**RFP Website:** <https://grants.nih.gov/grants/guide/pa-files/PA-19-056.html>

**Brief Description:** The NIH Research Project Grant supports a discrete, specified, circumscribed project in scientific areas that represent the investigators' specific interests and competencies and that fall within the mission of the participating NIH Institutes and Centers (ICs). The R01 is the original, and historically the oldest, grant mechanism used by the NIH to support health-related research and development.

Research grant applications are assigned to participating ICs based on receipt and referral guidelines and applications may be assigned to multiple participating ICs with related research interests. Applicants are encouraged to identify a participating IC that supports their area of research via the [R01 IC-Specific Scientific Interests and Contact](#) website and contact Scientific/Research staff from relevant ICs to inquire about their interest in supporting the proposed research project.

This Funding Opportunity Announcement does not accept applications proposing clinical trial(s). For specific information about the mission of each NIH IC, visit the [List of NIH Institutes, Centers, and Offices](#) website.

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

**Letter of Intent:** Not Required

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

The first standard application due date for this FOA is February 5, 2019.

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: Infrastructure for Rebuilding America (INFRA) Grant Program**

**Agency: Department of Transportation NSFHP-19-INFRA19**

**Website:** <https://www.transportation.gov/buildamerica/infragrants>

**Brief Description:** INFRA advances a grant program established in the FAST Act of 2015 and utilizes updated criteria to evaluate projects to align them with national and regional economic vitality goals and to leverage additional non-federal funding. The program will increase the impact of projects by leveraging federal grant funding and incentivizing project sponsors to pursue innovative strategies, including public-private partnerships. Additionally, the new program promotes the incorporation of innovative technology that will improve our transportation system. INFRA will also hold recipients accountable for their performance in project delivery and operations.

**Awards:** The Department will make awards under the INFRA program to both large and small projects. For a large project, the INFRA grant must be at least \$25 million. For a small project, the grant must be at least \$5 million. For each fiscal year of INFRA funds, 10 percent of available funds are reserved for small projects.

**Proposal Deadline:** March 4, 2019

**Contact Information:** For more information, visit: [www.transportation.gov/INFRA](http://www.transportation.gov/INFRA).

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

**Grant Program: 2019 ERDC Broad Agency Announcement**

**Agency: Department of Defense; Engineer Research and Development Center W912HZ-19-BAA-01**

**Website:** <https://www.erdcd.usace.army.mil/>

**Brief Description:** The U.S. Army Engineer Research and Development Center (ERDC) has issued a Broad Agency Announcement (BAA) for various research and development topic areas. The ERDC consists of the Coastal and Hydraulics Lab (CHL), the Geotechnical and Structures Lab (GSL), the USACE Reachback Operations Center (UROC), the Environmental Lab (EL) and the Information Technology Lab (ITL) in Vicksburg, Mississippi; the Cold Regions Research and Engineering Lab (CRREL) in Hanover, New Hampshire; the Construction Engineering Research Lab (CERL) in Champaign, Illinois; and the Geospatial Research Laboratory (GRL) in Alexandria, Virginia. The ERDC is responsible for conducting research in the broad fields of hydraulics, dredging, coastal engineering, instrumentation, oceanography, remote sensing, geotechnical engineering, earthquake engineering, soil effects, vehicle mobility, self-contained munitions, military engineering, geophysics, pavements, protective structures, aquatic plants, water quality, dredged material, treatment of hazardous waste, wetlands, physical/mechanical/chemical properties of snow and other frozen precipitation, infrastructure and environmental issues for installations, computer science, telecommunications management, energy, facilities maintenance, materials and structures, engineering processes, environmental processes, land and heritage conservation, and ecological processes.

**Awards:** Various

**Proposal Deadline:** All proposals initially submitted in response to this BAA will be considered preproposals. Should ERDC evaluation indicate a need for a full proposal, one will be requested from the offeror. Until January 31, 2020

**Contact Information:** For questions regarding proposals to CHL, GSL, EL, ITL, CRREL, and UROC submit your question to the following e-mail address: [ERDC-BAA@usace.army.mil](mailto:ERDC-BAA@usace.army.mil). You may also contact Reginald Bryant at 601-634-7166.

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**Grant Program: Measuring Biological Aptitude**

**Agency: Department of Defense; DARPA HR001119S0021**

**Website:**

[https://www.fbo.gov/index?s=opportunity&mode=form&id=c4507cfbb9f9e355478a2394e3898015&tab=core&\\_cview=1](https://www.fbo.gov/index?s=opportunity&mode=form&id=c4507cfbb9f9e355478a2394e3898015&tab=core&_cview=1)

**Brief Description:** The Measuring Biological Aptitude (MBA) program aims to address the need for a more capable fighting force by improving how an individual warfighter identifies, measures, and tracks personalized biomarkers to help achieve new levels of performance for specialized roles throughout their career. The MBA program will give warfighters the ability to understand, in real-time, the underlying biological processes that govern their own performance by elucidating the internal expression circuits (e.g., genetic, epigenetic, metabolomic, etc.) that shape military-relevant cognitive, behavioral, and physical traits. Simultaneously, the program will create new technologies for tracking these expression circuits in real time, providing instantaneous user feedback to aid the warfighter to be successful throughout training, assessment and selection, and mission execution for their desired military specialty.

**Awards:** Multiple awards are possible. The amount of resources made available to each performer under this BAA will depend on the quality of the proposals received and the availability of funds.

**Proposal Deadline:** Proposal Abstract Due Date and Time: February 28, 2019, 4:00 pm Eastern Standard Time  
o Proposal Due Date and Time: April 8, 2019, 4:00 pm Eastern Standard Time  
o BAA Closing Date: April 8, 2019  
o Proposers Day – February 12, 2019 <https://events.sa-meetings.com/MBAPD2019>

**Contact Information:** The BAA Coordinator for this effort may be reached at: [MBA@darpa.mil](mailto:MBA@darpa.mil)

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**Grant Program: FY 2019 Intelligence Community Centers for Academic Excellence (IC CAE) Program**

**Agency:** Department of Defense; Defense Intelligence Agency HHM402-19-FOA-399

**Website:** <https://www.grants.gov/web/grants/search-grants.html>

**Brief Description:** Accessing the 2019 IC CAE Funding Opportunity Announcement, HHM402-19-FOA-399. New users of www.grants.gov website need to first register and obtain a user identifier and password to use for logging into the site. Once registered and logged into the website, an applicant can click the "Current Efforts" tab and select "Intelligence Community Centers for Academic Excellence FOA # HHM402-19-FOA-399" page under the list. "Questions/Answer" section will be developed where all can view responses to all questions and comments, including those submitted by other organizations. Answers will be posted as they are developed. ALL QUESTIONS ARE TO BE SENT TO EMAIL ~FOA399@dodiis.mil. Answers will be posted on Grants.gov.

**Awards:** Up to \$300,000; Anticipated Available Funding: \$12,000,000

**Proposal Deadline:** February 24, 2019

**Contact Information:** Anthony D Hawkins Grantor Phone 202 231 3756 [~FOA399@dodiis.mil](mailto:~FOA399@dodiis.mil)

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**Grant Program: Combat Casualty Care - Multi-Domain Lifesaving Trauma Innovations (MuLTI) Award**

**Agency:** Department of Defense Dept. of the Army – USAMRAA W81XWH-19-S-CCC1

**Website:** <https://ebrap.org/eBRAP/public/Program.htm>

**Brief Description:** The MuLTI Award will support the development of highly innovative materiel products and new ways, methods, or modifications to existing trauma practice (i.e., knowledge products) for future multi-domain operations (MDO) where evacuation capabilities may be significantly delayed or unavailable. Projects should consider the varied expertise levels of the medical providers and the possible diverse environmental conditions. A focus is on enhancing capabilities at the point of greatest need, including life-saving interventions to be rendered immediately post-injury, during periods of prolonged care in theater, and during transport/en route care within and from theater. Medical materiel solutions are encouraged to include characteristics relevant to military use in austere, combat environments.

Focus Area 3 – Neurotrauma: The Neurotrauma Portfolio (NTP) is focused on closing military-relevant gaps across a broad range of research areas to improve the prevention, diagnosis, management, and

treatment of TBI and related sequelae from point-of-injury through recovery. The NTP's goal is to decrease morbidity and mortality from neurotrauma, mitigate secondary brain injury across all TBI severities, and advance materiel and knowledge development to expand and develop new clinical practice guidelines, care algorithms, therapies, devices, and procedures that advance the decision-making capabilities of medical personnel, enabling earlier intervention and improved outcomes. NOTE: For studies proposing animal research, provide justification for the use of nongyrencephalic (lissencephalic) models of TBI. • Interventions to reduce the incidence and severity of secondary brain injury. • Novel intervention and stabilization (e.g., maintain glucose levels, brain oxygenation, and cerebral blood flow) approaches to moderate and severe TBI. • Simplified diagnostic capabilities (e.g., imaging) that do not require extensive interpretation by medical providers. • Novel biofluid-based TBI biomarkers. The biomarker(s) can be prognostic or diagnostic and address mild or moderate TBI severities. Biomarkers that apply to multiple TBI severities (mild or moderate) are preferred. • Development of field applicable treatments for post traumatic central nervous system (CNS) tissue preservation.

**Awards:** The JPC-6/CCCRP expects to allot approximately \$10.7 million (M) of the FY19, \$9.9M of the FY20, and \$9.5M of the FY21 DHP RDT&E appropriations to fund approximately 12 to 30 FY19 DMRDP JPC-6/CCCRP MuLTI Award proposals/applications, depending on the quality and number of proposals/applications received. Funding of applications received in response to this BAA is contingent upon the availability of Federal funds for this program. The funding estimated for this BAA is approximate and subject to realignment.

**Proposal Deadline:** Pre-Proposal/Pre-Application Submission Deadline: 5:00 p.m. Eastern time (ET), March 5, 2019 • Invitation to Submit a Proposal/Application: April 11, 2019 • Proposal/Application Submission Deadline: 11:59 p.m. ET, May 29, 2019

**Contact Information:** CDMRP Help Desk Phone 301-682-5507 Email: [help@eBRAP.org](mailto:help@eBRAP.org)

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#### **Grant Program: CDMRP PRMRP Discovery Award**

**Agency:** Department of Defense Dept. of the Army – USAMRAA W81XWH-19-PRMRP-DA

**Website:** <https://ebrap.org/eBRAP/public/Program.htm>

**Brief Description:** The vision of the FY19 PRMRP is to improve the health, care, and well-being of all military Service members, Veterans, and beneficiaries. The PRMRP challenges the scientific and clinical communities to address the FY19 PRMRP Topic Areas with original ideas that foster new directions along the entire spectrum of research and clinical care. The program seeks applications in laboratory, clinical, behavioral, epidemiologic, and other areas of research to advance knowledge in disease etiology, improve prevention, detection, diagnosis, treatment, and quality of life for those affected by a relevant disease or condition, and to develop and validate clinical care or public health guidelines.

**Awards:** The intent of the PRMRP Discovery Award is to support innovative, non-incremental, highrisk/potentially high-reward research that will provide new insights, paradigms, technologies, or applications. Studies supported by this award are expected to lay the groundwork for future avenues of scientific investigation. The proposed research project should include a well formulated, testable hypothesis based on a sound scientific rationale and study design. The anticipated direct costs budgeted for the entire period of performance for an FY19 PRMRP Discovery Award will not exceed \$200,000.

**Proposal Deadline:** Pre-Application Submission Deadline: 5:00 p.m. Eastern time (ET), March 28, 2019 • Application Submission Deadline: 11:59 p.m. ET, April 11, 2019

**Contact Information:** CDMRP Help Desk Phone 301-682-5507 Email: [help@eBRAP.org](mailto:help@eBRAP.org)

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#### **Grant Program: CDMRP Peer Reviewed Medical Research Program Technology/Therapeutic Development Award**

**Agency:** Department of Defense Dept. of the Army – USAMRAA W81XWH-19-PRMRP-TTDA

**Website:** <https://ebrap.org/eBRAP/public/Program.htm>

**Brief Description:** The vision of the FY19 PRMRP is to improve the health, care, and well-being of all military Service members, Veterans, and beneficiaries. The PRMRP challenges the scientific and clinical communities to address at least one of the FY19 PRMRP Topic Areas with original ideas that foster new directions along the entire spectrum of research and clinical care. The program seeks applications in laboratory, clinical, behavioral, epidemiologic, and other areas of research to advance knowledge in disease etiology, improve prevention, detection, diagnosis, treatment, and quality of life for those affected by a relevant disease or condition, and to develop and validate clinical care or public health guidelines.

**Awards:** The anticipated direct costs budgeted for the entire period of performance for an FY19 PRMRP TTDA award will not exceed \$3M.

Anticipated available funding: \$72,000,000

**Proposal Deadline:** Pre-Application Submission Deadline: 5:00 p.m. Eastern time (ET), March 14, 2019

• Invitation to Submit an Application: May 2019 • Application Submission Deadline: 11:59 p.m. ET, July 11, 2019

**Contact Information:** CDMRP Help Desk Phone 301-682-5507 Email: [help@eBRAP.org](mailto:help@eBRAP.org)

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**Grant Program: CDMRP Peer Reviewed Medical Research Program Focused Program Award**

**Agency: Department of Defense Dept. of the Army – USAMRAA W81XWH-19-PRMRP-FPA**

**Website:** <https://ebrap.org/eBRAP/public/Program.htm>

**Brief Description:** The vision of the FY19 PRMRP is to improve the health, care, and well-being of all military Service members, Veterans, and beneficiaries. The PRMRP challenges the scientific and clinical communities to address at least one of the FY19 PRMRP Topic Areas with original ideas that foster new directions along the entire spectrum of research and clinical care. The program seeks applications in laboratory, clinical, behavioral, epidemiologic, and other areas of research to advance knowledge in disease etiology, improve prevention, detection, diagnosis, treatment, and quality of life for those affected by a relevant disease or condition, and to develop and validate clinical care or public health guidelines.

The PRMRP Focused Program Award mechanism is intended to optimize research and accelerate solutions to a critical question related to at least one of the Congressionally directed FY19 PRMRP Topic Areas through a synergistic, multidisciplinary research program.

**Awards:** The anticipated direct costs budgeted for the entire period of performance for an FY19 PRMRP Focused Program Award will not exceed \$7.2M. Refer to Section II.D.5, Funding Restrictions, for detailed funding information.

Anticipated available funding: \$43,000,000

**Proposal Deadline:** Pre-Application Submission Deadline: 5:00 p.m. Eastern time (ET), March 14, 2019

• Invitation to Submit an Application: April 2019 • Application Submission Deadline: 11:59 p.m. ET, July 2, 2019

**Contact Information:** CDMRP Help Desk Phone 301-682-5507 Email: [help@eBRAP.org](mailto:help@eBRAP.org)

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

**Agency: Department of Defense Dept. of the Army – USAMRAA W81XWH-19-PRMRP-IIRA**

**Website:** <https://ebrap.org/eBRAP/public/Program.htm>

**Brief Description:** The vision of the FY19 PRMRP is to improve the health, care, and well-being of all military Service members, Veterans, and beneficiaries. The PRMRP challenges the scientific and clinical communities to address at least one of the FY19 PRMRP Topic Areas with original ideas that foster new directions along the entire spectrum of research and clinical care. The program seeks applications in laboratory, clinical, behavioral, epidemiologic, and other areas of research to advance knowledge in disease etiology, improve prevention, detection, diagnosis, treatment, and quality of life for those affected by a relevant disease or condition, and to develop and validate clinical care or public health guidelines.

The PRMRP Investigator-Initiated Research Award (IIRA) is intended to support studies that will make an important contribution toward research and/or patient care for a disease or condition related to at least one of the FY19 PRMRP Topic Areas. The rationale for a research idea may be derived from a laboratory discovery, population-based studies, a clinician's first-hand knowledge of patients, or anecdotal data. Applications must include relevant data that support the rationale for the proposed study. These data may be unpublished or from the published literature.

**Impact:** The Investigator-Initiated Research Award is designed to support research with the potential to yield highly impactful data that could lead to critical discoveries or major advancements. The application must clearly demonstrate the project's potential immediate and long-range outcome(s)/product(s) (knowledge and/or material) and how they will impact a central critical problem or question in the field of research and/or patient care in the FY19 PRMRP Topic Area(s) addressed.

Research projects may focus on any phase of research from basic laboratory research through translational research, including preclinical studies in animal models and human subjects, as well as correlative studies associated with an existing clinical trial. Research involving human subjects and human anatomical substances is permitted; however, this award may not be used to conduct clinical trials. A clinical trial is defined as a prospective accrual of patients (human subjects) in whom an intervention (e.g., device, drug, biologic, surgical procedure, rehabilitative modality, behavioral intervention, or other) is tested for a measurable outcome with respect to safety, effectiveness, and/or efficacy. This outcome represents a direct effect on the subject of that intervention or interaction.

**Awards:** The anticipated direct costs budgeted for the entire period of performance for an FY19 PRMRP IIRA award will not exceed \$1.2M.

Anticipated available funding: \$79,600,000

**Proposal Deadline:** Pre-Application Submission Deadline: 5:00 p.m. Eastern time (ET), March 14, 2019

• Invitation to Submit an Application: May 2019 ♣ Application Submission Deadline: 11:59 p.m. ET, July 11, 2019

**Contact Information:** CDMRP Help Desk Phone 301-682-5507 Email: [help@eBRAP.org](mailto:help@eBRAP.org)

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**Grant Program: Technologies for Mixed-mode Ultra Scaled Integrated Circuits (T-MUSIC)**

**Agency: Department of Defense DARPA - Microsystems Technology Office HR001119S0016**

**Website:**

<https://www.fbo.gov/index?s=opportunity&mode=form&id=d9dcb5f58978dd3aea11e4d0cb5d1e9e&tab=core&cvview=1>

**Brief Description:** The DARPA Microsystems Technology Office is soliciting research proposals for the development of advanced RF mixed-mode foundry processes, building blocks, and novel high frequency mixed-mode devices on a CMOS fabrication platform. It is expected that such advances will enable new DoD applications including high capacity, robust communications, radars, and precision sensors.

The first annual ERI Summit, held in July 2018, featured four workshops designed to generate ideas for future ERI programs. Three key issues emerged from the workshop discussions: the need to support domestic manufacturing options and enable them to develop differentiated capabilities for diverse needs; a demand to invest in chip security; and a desire to create new connections between the various ERI programs and to demonstrate the resulting technologies in defense applications. ERI Phase II will build on the existing ERI programs to address all of these challenges, with the goal of supporting a domestic semiconductor manufacturing industry that can implement specialized circuits, demonstrate that those circuits can be trusted through the supply chain and are built with security in mind, and are ultimately available to both DoD and commercial sector users. To create unique and differentiated domestic manufacturing capabilities, potential areas of exploration in ERI Phase II include the integration of photonics and radiofrequency (RF) components directly into advanced circuits and semiconductor manufacturing processes. DARPA has announced the Photonics in the Package for Extreme Scalability (PIPES) and Technologies for Mixed-mode Ultra Scaled Integrated Circuits (T-MUSIC) within this area.

To provide for trustable electronics components, potential Phase II areas of exploration include electronics that can enforce security and privacy protections as well as technologies to enable traceability for electronic components from design through to use. DARPA has announced Guaranteed Architecture for Physical Security (GAPS) within this area.

**Awards:** Various

**Proposal Deadline:** Abstract Due Date: January 25, 2019 – 1:00 PM EST o FAQ Submission Deadline: February 18, 2019 – 1:00 PM EST o Proposal Due Date: March 12, 2019 – 1:00 PM EST

**Contact Information:** BAA Coordinator [HR001119S0016@darpa.mil](mailto:HR001119S0016@darpa.mil)

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**Grant Program: Guaranteed Architecture for Physical Security (GAPS)**

**Agency: Department of Defense DARPA - Microsystems Technology Office HR001119S0017**

**Website:**

[https://www.fbo.gov/index?s=opportunity&mode=form&id=cfecfe762954149924ec59c95ec6a7b8&tab=core&\\_cview=1](https://www.fbo.gov/index?s=opportunity&mode=form&id=cfecfe762954149924ec59c95ec6a7b8&tab=core&_cview=1)

**Brief Description:** The Microsystems Technology Office at DARPA seeks innovative proposals in the areas of developing hardware security and software architectures with physically provable guarantees to isolate high risk transactions and to enable systems with multilevel data security assertions. Like many system owners, the Department of Defense (DoD) processes sensitive data in system enclaves, isolated from other systems. Corporate and government system architects pay particular attention to any interfaces between such enclaves and less trusted systems. In this BAA, we define ‘high risk transactions’ as instances when data moves between systems of different security levels. Today, modern computing systems are incapable of creating sufficient security protections such that they can be trusted with the most sensitive data while simultaneously being exposed to untrusted data streams. Specifically, it is common knowledge that one should not load extremely sensitive data on internet-facing computing systems (even if you install an anti-virus product). Therefore, for the most sensitive computing systems, DoD and commercial industry have in certain places adopted a series of air-gaps – breaks between computing systems to prevent the leakage and compromise of sensitive information. For the purposes of the GAPS program, we consider high risk transactions in terms of privacy and security that are required and pay particular attention when ‘secure’ and ‘unsecure’ systems are attached. Over the past 40 years this has led to niche industries of ‘guards’ that are typically externally retrofitted into existing systems in contrast to mature engineering processes that considers security as part of a system.

**Awards:** Various

**Proposal Deadline:** Proposers Day: January 23, 2019 o TA1 and TA2 Abstract Due Date: February 1, 2019 ♣ No abstracts for TA3 o TA1 and TA2 FAQ Submission Deadline: March 8, 2019 o TA3 FAQ Submission Due Date: February 18, 2019 o TA1 and TA2 Proposal Due Date: March 22, 2019 o TA3 Proposal Due Date: March 4, 2019

**Contact Information:** Walter Weiss, Program Manager BAA Coordinator: [GAPS@darpa.mil](mailto:GAPS@darpa.mil)  
DARPA/MTO ATTN: HR001119S0017 675 North Randolph Street Arlington, VA 22203-2114

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**Grant Program: Long Range BAA**

**Agency: Department of Defense Office of Naval Research N00014-19-S-B001**

**Website:** <https://www.onr.navy.mil/work-withus/funding-opportunities>

**Brief Description:** The Office of Naval Research (ONR), ONR Global (ONRG), and the Marine Corps Warfighting Lab (MCWL) are interested in receiving proposals for Long-Range Science and Technology (S&T) Projects which offer potential for advancement and improvement of Navy and Marine Corps operations. Readers should note that this is an announcement to declare ONR’s broad role in competitive funding of meritorious research across a spectrum of science and engineering disciplines.

**Awards:** Various



**Proposal Deadline:** September 30, 2019

**Contact Information:** Veronica Lacey Grants Specialist [Grants.gov Questions](#)

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**Grant Program:** FY19 Office of Naval Research (ONR) Navy and Marine Corps Science, Technology, Engineering & Mathematics (STEM), Education and Workforce Program

**Agency:** Department of Defense Office of Naval Research N00014-19-S-F003

**Website:** <https://www.onr.navy.mil/Contracts-Grants/Funding-Opportunities/Broad-Agency-Announcements.aspx>

**Brief Description:** The ONR seeks a broad range of applications for augmenting existing or developing innovative solutions that directly maintain, or cultivate a diverse, world-class STEM workforce in order to maintain the U.S. Navy and Marine Corps' technological superiority. The goal of any proposed effort must provide solutions that will establish and maintain pathways of diverse U.S. citizens who are interested in uniformed or civilian DoN (or Navy and Marine Corps) STEM workforce opportunities. As the capacity of the DoN Science and Technology (S&T) workforce is interconnected with the basic research enterprise and STEM education system, ONR recognizes the need to support efforts that can jointly improve STEM student outcomes and align educational efforts with Naval S&T current and future workforce needs. This announcement explicitly encourages projects that improve the capacity of education systems and communities to create impactful STEM educational experiences for students and workers. Submissions are encouraged to consider including active learning approaches and incorporating 21st century skill development. Projects must aim to increase student and worker engagement in STEM and enhance people with needed Naval STEM capabilities. ONR encourages applications to utilize current STEM educational research for informing project design and advancing our understanding of how and why people choose STEM careers and opportunities of naval relevance.

**Awards:** ONR's total STEM funding effort is \$6,250,000 per year, subject to the availability of funds. Under this FOA competition, ONR intends to award approximately twenty-five (25) awards for a maximum of \$250,000 per year for each award, with one-year (1) option periods for up to three (3) years.

**Proposal Deadline:** White Paper Inquiries and Questions 17 June 2019 (Monday) White Papers must be received between 1 April 2019 (Monday) with a deadline of 28 June 2019 (Friday) at 5:00 PM Eastern Time Application Inquiries and Questions 16 September 2019 (Monday) Applications must be received no later than 27 September 2019 (Friday) at 11:59 PM Eastern Time

**Contact Information:** David Broadwell Grant Management Specialist Phone 703-588-2866

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**Grant Program:** Microsystems Technology Office (MTO)

**Agency:** Department of Defense DARPA HR001118S0060

**Website:**

<https://www.fbo.gov/index?s=opportunity&mode=form&id=68dfd959363ffdeb96f61c065e212ef7&tab=core&cvview=1>

**Brief Description:** Since its inception in 1991, MTO has helped create and prevent strategic surprise through investments in compact microelectronic components such as microprocessors, microelectromechanical systems (MEMS), and photonic devices. MTO's revolutionary work applying advanced capabilities in areas such as wide-band gap materials, phased array radars, high-energy lasers, and infrared imaging have helped the United States establish and maintain technological superiority for more than two decades. MTO seeks to develop high-risk, high-reward technologies that continue DARPA's mission of creating and preventing strategic surprise, help to secure the Department of Defense's (DoD) technological superiority, and address the complex threats facing U.S. national security. Proposed research should investigate innovative approaches that enable revolutionary advances in science, devices, or systems. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice. As MTO evolves to address future microsystems-related

challenges, the office has identified three target thrust areas: (1) Electronics: Managing Moore's Inflection, (2) Spectrum: Enhancing Our Advantage with Agility and Autonomy, and (3) Sensors: Decentralized Sensors for the DoD.

**Awards:** Multiple

**Proposal Deadline:**

Abstract Due Date: Abstracts may be submitted on a rolling basis until 1:00PM on May 26, 2020. o

Proposal Due Date: Proposals may be submitted on a rolling basis until 1:00PM on June 26, 2020.

**Contact Information:** Dr. William Chappell Director, Microsystems Technology Office BAA  
Coordinator: [HR001118S0060@darpa.mil](mailto:HR001118S0060@darpa.mil)

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**Grant Program: AFRL/RXC Structural Materials Open BAA**

**Agency: Department of Defense Air Force -- Research Lab FA8650-18-S-5010**

**Website:** <http://cdmrrp.army.mil/funding/dmrrdp>

**Brief Description:** Air Force Research Laboratory, Materials & Manufacturing Directorate, Structural Materials Division, AFRL/RXC, is soliciting white papers and potentially technical and cost proposals under this announcement that support the needs of its Structural Materials and Applications mission. Structural Materials technologies that range from materials and scientific discovery through technology development and transition are of interest. Descriptors of Materials and Manufacturing Directorate technology interests are presented in two contexts in the Statement of Objectives (BAA Attachment 1); that of structural materials science and engineering academic "competencies," and that of Air Force application area needs.

**Awards:** Up to \$5,000,000; Available program funding: \$99,500,000

**Proposal Deadline:** White Paper Submission: 20 September 2023

Proposal Submission: Due followed by white paper submission and review

**Contact Information:** Adrianna Menker Contracting/Grants Officer Phone 937-713-9924

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**Grant Program: NRL Long Range Broad Agency Announcement (BAA) for Basic and Applied Research**

**Agency: Department of Defense Naval Research Laboratory N00173-18-S-BA01**

**Website:** <https://www.nrl.navy.mil/doing-business/Current-NRL-BAA>

**Brief Description:** The Naval Research Laboratory (NRL) The Naval Research Laboratory (NRL) is the Navy's corporate laboratory. NRL conducts basic and applied research for the Navy in a variety of scientific and technical disciplines. The basic research program is driven by perceptions about future requirements of the Navy. NRL conducts most of its research program at its own facilities but also funds some related research such as anticipated by this announcement. More extensive research support opportunities are available from the Naval Research Laboratory (NRL). NRL announcements may be accessed via the Internet at <https://www.nrl.navy.mil/doingbusiness/contracting-division/baa>. NRL is interested in receiving proposals for Long-Range Science and Technology (S&T) Projects which offer potential for advancement and improvement of Navy and Marine Corps operations. Readers should note that this is an announcement to declare NRL's broad role in competitive funding of meritorious research across a spectrum of science and engineering disciplines. A brief description of the NRL Program Codes and the science and technology thrusts that NRL is pursuing is provided below. Additional information can be found at the NRL website at <https://www.nrl.navy.mil/research/directorates-divisions/>. This announcement is an expression of interest only and does not commit the Government to make any award or to pay for any proposal preparation costs.

**Awards:** Various

**Proposal Deadline:** May 9, 2019

**Contact Information:** Mary Johnson Contract Specialist Phone 202-767-2021

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## **Department of Education**

### **Grant Program: Fulbright-Hays Group Projects Abroad (GPA) Short-Term Project**

**Agency: Department of Education CFDA Number 84.021A**

**Website:** <https://www.govinfo.gov/content/pkg/FR-2019-01-24/pdf/2019-00107.pdf>

**Brief Description:** The purpose of the Fulbright-Hays GPA Program is to promote, improve, and develop modern foreign languages and area studies at varying levels of education. The program provides opportunities for faculty, teachers, and undergraduate and graduate students to conduct individual and group projects overseas to carry out research and study in the fields of modern foreign languages and area studies. This notice relates to the approved information collection under OMB control number 1840-0792.

This competition invites applicants to submit an application to request support for either a Fulbright-Hays GPA short-term project (GPA short-term projects 84.021A) or a Fulbright-Hays GPA long-term project (GPA long-term projects 84.021B). Applicants must clearly indicate on the SF 424, Application for Federal Assistance cover sheet whether they are applying for a GPA short-term project (84.021A) or a GPA long-term project (84.021B). Additional submission details are included in the application package.

There are three types of GPA short-term projects: (1) Short-term seminar projects of four to six weeks in length designed to help integrate international studies into an institution's or school system's general curriculum by focusing on a particular aspect of area study, such as the culture of an area or country of study (34 CFR 664.11); (2) curriculum development projects of four to eight weeks in length that provide participants an opportunity to acquire resource materials for curriculum development in modern foreign language and area studies for use and dissemination in the United States (34 CFR 664.12); and (3) group research or study projects of three to twelve months in duration designed to give participants the opportunity to undertake research or study in a foreign country (34 CFR 664.13).

**Awards:** Up to \$100,000. Estimated total funding: \$1,000,000

**Proposal Deadline:** March 25, 2019; Applications available: January 24, 2019. Deadline for transmittal of applications: March 25, 2019.

**Contact Information:** Julius C Cotton ED Grants.gov FIND Systems Admin. Phone 202-245-6288 [julius.cotton@ed.gov](mailto:julius.cotton@ed.gov)

Program Manager: Cory Neal, U.S. Department of Education, 400 Maryland Avenue SW, Room 258-42, Washington, DC 20202. Telephone: (202) 453-6137. Email: GPA@ed.gov .

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## **EPA**

### **Grant Program: 16th Annual P3 Awards: A National Student Design Competition Focusing on People, Prosperity and the Planet - Safe and Sustainable Water Resources**

**EPA-G2019-P3-Q1 – Air Quality**

**EPA-G2019-P3-Q2 – Safe and Sustainable Water Resources**

**EPA-G2019-P3-Q3 – Sustainable and Healthy Communities**

**EPA-G2019-P3-Q4 – Chemical Safety**

**Agency: Environmental Protection Agency**

**Website:** <https://www.epa.gov/research-grants/16th-annual-p3-awards-national-student-design-competition-focusing-people-prosperity>

**Brief Description:** The U.S. Environmental Protection Agency (EPA) – as part of its People, Prosperity and the Planet (P3) Award Program – is seeking applications proposing to research, develop, design, and demonstrate solutions to real world challenges. The P3 competition highlights the use of scientific principles in creating innovative technology-based projects that achieve the mutual goals of improved

quality of life, economic prosperity, and protection of the planet – people, prosperity, and the planet. The EPA offers the P3 competition to respond to the needs of people in the United States (U.S.)—e.g., those in small, rural, tribal, and disadvantaged communities. Please see the People, Prosperity and the Planet (P3) Student Design Competition website for more details about this program. Proposed projects must embody the P3 approach, which is that they have the intention and capability to simultaneously improve the quality of people’s lives, provide economic benefits, and protect the environment.

This solicitation provides the opportunity for the submission of applications for projects that may involve human subjects research. Human subjects research supported by the EPA is governed by EPA Regulation 40 CFR Part 26 (Protection of Human Subjects). This includes the Common Rule at subpart A and prohibitions and additional protections for pregnant women and fetuses, nursing women, and children at subparts B, C, and D. Research meeting the regulatory definition of intentional exposure research found in subpart B is prohibited by that subpart in pregnant women, nursing women, and children. Research meeting the regulatory definition of observational research found in subparts C and D is subject to the additional protections found in those subparts for pregnant women and fetuses (subpart C) and children (subpart D). All applications must include a Human Subjects Research Statement (HSRS, as described in Section IV.C.5.b of this solicitation), and if the project involves human subjects research, it will be subject to an additional level of review prior to funding decisions being made as described in Sections V.C and V.D of this solicitation.

**Awards;** The first phase is a competition for one-year grants of up to \$25,000 to test, research, and develop innovative scientific projects or engineering designs that use the P3 approach. In the spring of 2020, the Phase I grantees awarded from this solicitation are required to present their projects/designs at the National Student Design Expo. EPA will provide teams with information about the Expo during the award year. At the end of Phase I, teams will submit a *Project Report* that will serve as an application for a Phase II grant award of up to \$100,000. The Phase II grant awards are intended to support the further development and demonstration of the projects/designs created in Phase I. The competitors for 2020 P3 Phase II grants are limited to recipients of Phase I grant awards from this solicitation.

**Submission Deadline:** December 11, 2018, 11:59:59 pm Eastern Time

**Contact Information:** Technical Contact: Angela Page (page.angelad@epa.gov), Phone: 202-564-7957; Eligibility Contact: Ron Josephson (josephson.ron@epa.gov), Phone: 202-564-7823; Electronic Submissions: Debra M. Jones (jones.debram@epa.gov), Phone: 202-564-7839

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## **Department of Energy**

### **Grant Program: DE-FOA-0002021: Notice of Intent to Issue Funding Opportunity Announcement No. DE-FOA-0002022**

**Agency:** Department of Energy DE-FOA-0002021

**Website:** <https://eere-exchange.energy.gov/>

**Brief Description:** The Office of Energy Efficiency and Renewable Energy (EERE) intends to issue, on behalf of the Fuel Cell Technologies Office (FCTO), Funding Opportunity Announcement (FOA) DE-FOA-0002022 entitled “Fiscal Year 2019 H2@Scale Funding Opportunity Announcement.” Hydrogen is one part of DOE’s all-of-the-above energy portfolio, and can offer options for affordable and secure energy for transportation, as well as for stationary and industrial applications. The United States produces over 10 million metric tons of hydrogen per year, used primarily for petroleum refining and fertilizer production, but there are a number of opportunities to increase hydrogen generation and utilization across the country. “H2@Scale” is an initiative to enable affordable and reliable largescale hydrogen generation, transport, storage, and utilization in the United States across sectors. For example, electrolyzers can produce hydrogen by splitting water when power generation exceeds demand. This can reduce or prevent curtailment of renewables, optimize baseload (e.g., nuclear power) assets, and enable grid stability and resiliency, while also producing hydrogen as a fuel or feedstock for end users. In addition, hydrogen

produced from existing baseload assets can be stored, distributed, and used as a fuel for transportation, stationary power, process or building heat, and industrial sectors (e.g. steel manufacturing), creating an additional revenue stream for those assets. FCTO focuses on research, development, and innovation to advance hydrogen and fuel cells for transportation and diverse applications enabling energy security, resiliency, and a strong domestic economy in emerging technologies. This notice of intent (NOI) is issued so that interested parties are aware of the EERE's intention to issue this FOA in the near term. All of the information contained in this NOI is subject to change. EERE will not respond to questions concerning this NOI. Once the FOA has been released, EERE will provide an avenue for potential applicants to submit questions. EERE plans to issue the FOA in January/February of 2019 via the EERE Exchange website <https://eere-exchange.energy.gov/>. If applicants wish to receive official notifications and information from EERE regarding this FOA, they should register in EERE Exchange. When the FOA is released, applications will be accepted only through EERE Exchange.

**Awards:** TBD

**Submission Deadline:** TBD

**Contact:** [EERE-ExchangeSupport@hq.doe.gov](mailto:EERE-ExchangeSupport@hq.doe.gov)

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**Grant Program: FY 2019 Bioenergy Technologies Office (BETO) Multi-topic Request for Information (RFI)**

**Agency:** Department of Energy DE-FOA-0002020

**Website:** <https://eere-exchange.energy.gov/>

**Brief Description:** The U.S. Department of Energy (DOE) Office of Energy Efficiency and Renewable Energy (EERE) Bioenergy Technologies Office (BETO) is requesting information on research opportunities related to outdoor algae research, biomass characteristics and feedstock performance, and renewable energy from urban and suburban wastes to help inform its research priorities and funding strategies. BETO seeks information to help inform its research priorities, as part of its annual planning process. The purpose of this RFI is to solicit feedback from industry, academia, research laboratories, government agencies, and other stakeholders to help ensure research areas are relevant, timely, appropriate for federal government funding, and aligned with Administration priorities. This is solely a request for information and not a Funding Opportunity Announcement (FOA). No funding applications are being accepted in response to this RFI. Specifically, BETO is seeking information related to the following three topic areas: 1) Outdoor Algae Research; 2) Biomass Characteristics and Feedstock Performance; and 3) Renewable Energy from Urban and Suburban Wastes. Please see the full Request for Information (RFI) DE-FOA-0002020 at <https://eere-exchange.energy.gov/>.

**Awards:** TBD

**Submission Deadline:** TBD

**Contact:** [EERE\\_Bioenergy@ee.doe.gov](mailto:EERE_Bioenergy@ee.doe.gov)

Submit RFI Responses to this Inbox

- [EEREExchangeSupport@hq.doe.gov](mailto:EEREExchangeSupport@hq.doe.gov)

For EERE Exchange questions:

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**NASA**

**Grant Program: ROSES 2018: Remote Sensing Theory for Earth Science**

**Agency:** NASA NNH18ZDA001N-RST

**Website:** <https://nspires.nasaprs.com/external/solicitations/summary.do?solId=%7B5BF2E896-B51E-AE03-FF42-17EB9208238B%7D&path=open&method=init>

**Brief Description:** Remote sensing science to establish a theoretical basis for measuring Earth surface properties using reflected, emitted, and scattered electromagnetic radiation and to develop the

methodologies and technical approaches to analyze and interpret such measurements lies at the heart of NASA's mission. Remote sensing science investigations are needed to prepare for new remote sensing measurements of the Earth from space and to ascertain the readiness of candidate technologies for obtaining them. The objective of the Remote Sensing Theory (RST) program element, a multidisciplinary/interdisciplinary program, is to enable major steps in algorithm and future technology development that will ultimately lead to significant advances in remote sensing Earth observing. The program will support fundamental scientific, nonincremental advances in remote sensing theory and radiative transfer, including advancement of retrieval algorithms to be used for space-based remote sensing of the Earth's atmosphere, oceans, biosphere, cryosphere, land surface, and/or Earth interior.

**Awards:** It is expected that there will be approximately \$4.8 M available in Fiscal Year (FY) 2019

**Notice of Intent:** Not Required

**Proposal Deadline:** RST18 NOIs Due Feb 28, 2019

RST18 Proposals Due Mar 22, 2019

**Contact:** Lucia Tsoussi Earth Science Division Science Mission Directorate National Aeronautics and Space Administration Washington, DC 20546-0001 Telephone: (202) 358-4471 Email: [Lucia.S.Tsoussi@nasa.gov](mailto:Lucia.S.Tsoussi@nasa.gov)

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### **Grant Program: ROSES 2018: Heliophysics Living With a Star**

**Agency:** NASA NNH18ZDA001N-LWS

**Website:** <https://nspires.nasaprs.com/external/solicitations/summary!init.do?solId={8DB28CFB-8DD8-8A61-F6FF-7418AACBBE0B}&path=open>

**Brief Description:** The Living With a Star (LWS) Program emphasizes the science necessary to understand those aspects of the Sun and Earth's space environment that affect life and society. A primary goal of the LWS program is to provide scientific understanding, with the potential for prediction, of the Heliosphere as a system. This includes an understanding of the space weather conditions from the Sun to the Earth and throughout the interplanetary medium, as well as the Sun-climate connection. The LWS program objectives are as follows: 1. Understand how the Sun varies and what drives solar variability. 2. Understand how the Earth and planetary systems respond to dynamic external and internal drivers. 3. Understand how and in what ways dynamic space environments affect human and robotic exploration activities.

**Awards:** It is expected that there will be approximately \$4.8 M available in Fiscal Year (FY) 2019

**Notice of Intent:** Not Required

**Proposal Deadline:** Step-1 Proposal Due February 14, 2019

**Contact:** Jeff Morrill Heliophysics Division, [jeff.s.morrill@nasa.gov](mailto:jeff.s.morrill@nasa.gov)

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### **National Endowment of Humanities**

#### **Grant Program: Institutes for Advanced Topics in the Digital Humanities**

**Agency:** National Endowment for the Humanities

**Website:** <https://www.neh.gov/grants/odh/institutes-advanced-topics-in-the-digital-humanities>

**Brief Description:** The Institutes for Advanced Topics in the Digital Humanities (IATDH) program supports national or regional (multistate) training programs for scholars, humanities professionals, and advanced graduate students to broaden and extend their knowledge of digital humanities. Through this program NEH seeks to increase the number of humanities scholars and practitioners using digital technology in their research and to broadly disseminate knowledge about advanced technology tools and methodologies relevant to the humanities. Applicants may apply to create institutes that are a single opportunity or are offered multiple times to different audiences. Institutes may be as short as a few days and held at multiple locations or as long as six weeks at a single site; virtual institutes are also permissible.

Training opportunities could be offered before or after regularly occurring scholarly meetings, during the summer months, or during appropriate times of the academic year. The duration of a program should allow for full and thorough treatment of the topic; it should also be appropriate for the intended audience. These professional development programs may focus on a particular computational method, such as network or spatial analysis. They may also target the needs of a particular humanities discipline or audience.

**Awards:** Maximum award amount \$250,000

**Deadline:** Optional Draft due: February 26, 2019

Application due: March 26, 2019

**Contact:** Contact the Office of Digital Humanities Team [odh@neh.gov](mailto:odh@neh.gov)

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## **Environment Research and Education Foundation**

**Grant Program: Research on Research on Sustainable Solid Waste Management and Recycling**

**Agency: Environment Research and Education Foundation**

**Website:** <https://erefdn.org/research-grants-projects/how-to-apply-for-grant/>

**Brief Description:** The sustainability movement has reached the business models of nearly every industry in the United States, and many companies, municipalities and states have set aggressive sustainability goals that include how waste streams are being managed. The EREF Board of Directors has set an initiative to ensure research funded reflects EREF's long-term strategic plan to address all areas of integrated solid waste management, with a strong focus towards research that increased sustainable solid waste management practices.

Pre-proposal topics must relate to sustainable solid waste management practices and pertain to the following topic areas:

1. Waste minimization
2. Recycling
3. Waste conversion to energy, biofuels, chemicals or other useful products. This includes, but is not limited to, the following technologies:
  - o Waste-to-energy
  - o Anaerobic digestion
  - o Composting
  - o Other thermal or biological conversion technologies
4. Strategies to promote diversion to higher and better uses (e.g. organics diversion, market analysis, optimized material management, logistics, etc.)
5. Landfilling

Upon submission, pre-proposals will be examined by a selection committee and successful pre-proposals will be invited to submit a full proposal for consideration. Full proposals will then be subjected to EREF's review process, as described later in this document.

**Proposal Deadline:** EREF has two deadlines per year for pre-proposals: December 1 and May 1

**Contact:** If interested, please send an email to Atam Dhawan ([dhawan@njit.edu](mailto:dhawan@njit.edu)).

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## **Medical Technology Enterprise Consortium (MTEC)**

**Grant Program: Support for Cell, Tissue, or Organ Bioengineering Technologies**

**Agency: Medical Technology Enterprise Consortium (MTEC)**

**Website:** <https://mtec-sc.org/>

**Brief Description: Technology Focus Areas**

The Joint Program Committee (JPC)-8/Clinical and Rehabilitative Medicine Research Program (CRMRP), the Defense Health Agency, Research, Development and Acquisition (DHA RDA), and the

Office of the Assistant Secretary of Defense for Health Affairs (OASD(HA)) have identified a need for regenerative medicine prototype development efforts and manufacturing technologies. cGMP quality is a requirement by the U.S. Food and Drug Administration (FDA) and European Medicines Agency to provide patients with clinical-grade products that are safe and have defined quality characteristics. However, standardization and robust manufacturing techniques are lacking in regenerative medicine, which will continue to impede progress in advancing regenerative medicine based technologies and treatments toward the clinic. This is likely due to many factors which need to be developed and advanced, including:

- (1) advancing bioreactor technology for cost-effective cell and tissue expansions,
- (2) improving cell, tissue, and organ preservation technology,
- (3) innovating and advancing large scale manufacturing and quality assurance for regenerative medicine based products, and
- (4) developing dynamic and innovative quality assurance strategies for regenerative medicine manufacturing.

Technologies of interest include, but are not limited to, the following:

### **1. Bioreactors to enable efficient and cost-effective cell and tissue expansion for regenerative medicine products**

For many regenerative medicine therapies, millions of cells are required for each patient. The cell and tissue expansion phase of the manufacturing process is by far the most expensive and time consuming step, often requiring several months to reach economically-viable numbers of cells. There is a significant need for alternatives to flat plate culture technologies for efficient and cost-effective cell and tissue expansion. Areas of interest to enhance cell expansion for regenerative medicine products include, but are not limited to:

- Non-invasive or minimally-invasive in-process technologies that can monitor key parameters of the expansion process, including but not limited to: cell viability, cell number, endotoxin content, mycoplasma
- Non-destructive cell harvesting technologies
- Single-use bioreactors for the scale-up of cells
- Infrastructure to allow cell expansion to occur in parallel
- Cell purification processes
- Scale up the production of organoids for industrial use

### **2. Cell, tissue, and product preservation for regenerative and personalized medicine**

Biobanking and biopreservation offers the possibility to preserve cells and tissue sources for future use. For regenerative and personalized medicine, these cells and tissues are later developed into products that need to be preserved to maintain activity during production, through manufacturing release, and ultimately to patient application. Therefore, there is a need to develop advanced, cost-effective technologies and processes for banking cells and tissues, and preserving regenerative medicine-based products to assist with shipping and distribution. Areas of interest include, but are not limited to:

- Novel preservation methods (e.g., non-cryogenic) that can be used on tissue engineered products during storage, shipping and distribution (including adverse environments such as austere conditions)
- Advanced systems and processes for cell and tissue preservation, including specimen harvest, cell retrieval, and tissue-typing
- Tests or methods to analyze or determine cell, tissue, or product viability/function following short-term and long-term storage

### **3. Large scale manufacturing and quality assurance of regenerative medicine-based products**

Regenerative medicine products in early development are often fabricated using laboratory-based processes and lack defined product specifications. Therefore, the intent of this area of interest is to transfer these laboratory-based processes into scalable, production-ready, commercial manufacturing processes



for cell, tissue, or organ bioengineering products with defined acceptance criteria. Specific areas of interest include, but are not limited to:

- Scalable, production-ready, commercial additive manufacturing, such as 3D printing for regenerative medicine applications
- Automated tissue digestion systems
- High throughput cell sorting technology
- High throughout cell separation/isolation from media
- Automated manufacturing processes
- Develop large scale systems capable of screening and engineering adult stem cells

#### **4. Dynamic and innovative quality assurance strategy for regenerative medicine manufacturing**

The identification and specification of standards and acceptance criteria are important for the regulatory approval of all implantable, manufactured products. Regenerative medicine-based products tend to have qualitative product acceptance criteria, which are difficult to standardize. Therefore, there is a need to develop and advance methods for quality assurance to assess process changes in regenerative medicine product manufacturing as well as in cell, tissue, and bioengineered organ product characteristics and function.

Areas of interest to enhance the quality assurance strategy of regenerative medicine products include, but are not limited to:

- Systems that can provide rapid batch testing for the evaluation of a production run
- Automated and non-destructive imaging systems for inspection and characterization of tissue engineered products
- Non-destructive in-process technologies that can monitor key parameters of the manufacturing process

**Awards:** The U.S. Government (USG) currently has available approximately \$6 million (M) for Fiscal Year (FY) 2019. Funds are intended to support areas of regenerative medicine manufacturing and prototyping that require development and harmonization into reproducible, consistent procedures which could stand the test of U.S. Food and Drug Administration (FDA) approval. MTEC anticipates that 2 awards of \$3M each (direct and indirect costs) will be made to qualified teams composed of teaming arrangements demonstrated to achieve advanced manufacturing and/or prototype development. The Period of Performance (POP) is not to exceed four years.

**Proposal Submission:** This RPP will be conducted using a two-staged approach. In Stage 1, current MTEC members are invited to submit White Papers using the format contained in the RPP. Offerors whose technology solution is selected for further consideration based on White Paper evaluation will be invited to submit a proposal in Stage 2. Notification letters will contain specific Stage 2 proposal submission requirements.

**Contact:** Technical questions – Dr. Lauren Palestrini, MTEC Director of Research, [lauren.palestrini@officer.mtec-sc.org](mailto:lauren.palestrini@officer.mtec-sc.org)

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### **Streamlyne Question of the Week**

**Question:** How can I add another investigator or my research ambassador to my proposal in order to help on budget preparation and edit proposal details?

**Answer:** Select the “Permissions” link from the left hand side of the main proposal screen in any proposal development document. From the Permissions screen you will be able to search for the person you wish to add and grant them a specific level of permission (aggregator, budget creator, viewer). After you select the appropriate person, click “Add” and they will be added to your proposal.

More FAQs on Streamlyne: Please visit <http://www.njit.edu/research/streamlyne/>

## **Streamlyne Information**

Streamlyne User Manuals: <http://www.njit.edu/research/streamlyne/>

**Streamlyne\_NewUserManual\_CommonElements.docx** : This manual provides a reference to all the common elements of Streamlyne Research. This user manual is a good document to review each module's functionality.

**Streamlyne\_NewUserManual\_PD&PDBudget.docx**: This is a user manual on proposal and budget development in Streamlyne. The content herein explain the use and functionality of this module. This is the most useful Streamlyne document for PIs and users new to Streamlyne.

New "How to Do" videos have been posted on the research website <http://www5.njit.edu/research/streamlyne/>.

Faculty and staff having any questions on proposal submission, may contact their college representatives, and also follow up with **Justin Samolewicz, Associate Director (Pre Award)** 973-596-3145; [justin.m.samolewicz@njit.edu](mailto:justin.m.samolewicz@njit.edu); and **Eric Hetherington, Director, Sponsored Research Programs Administration** 973-596-3631; [eric.d.hetherington@njit.edu](mailto:eric.d.hetherington@njit.edu). The college representatives to help PIs on proposal submissions are

**John McCarthy**, NCE Director of Research; (973) 596-3247; [john.p.mccarthy@njit.edu](mailto:john.p.mccarthy@njit.edu)

**Cristo Leon**, CSLA Director of Research; (973) 596-6426; [cristo.e.yanezleon@njit.edu](mailto:cristo.e.yanezleon@njit.edu)

**Sean Andrews**, YWCC Director of Research; (973) 596-5352; [sean.t.andrews@njit.edu](mailto:sean.t.andrews@njit.edu)

**Iris Pantoja**, NCE, CoAD and MTSM Project Manager; 973-596-4483; [irp3@njit.edu](mailto:irp3@njit.edu)

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## **Need Information about Funding?**

### **Finding Research Opportunities and Collaborations (FROC)**

#### **Walk-In Open-Hour Discussion with SVPR Over Tea**

Every Thursday: 3.00 PM-4.00 PM; 340 Fenster Hall

The Office of Research has started a new service to help all faculty and staff explore collaborative research opportunities and currently active RFPs (Request for Proposals) for potential proposal development and submission. Faculty and research staff members are welcome to meet with Senior Vice Provost for Research Atam Dhawan at the open-hour every Thursday from 3.00 PM to 4.00 PM to discuss research opportunities related issues including the following but not limited to:

- Research opportunities and potential collaborations
- Currently active RFPs and developing collaborative teams for proposal submission
- Proposal review criterion for specific RFP/program/agency
- Proposal concept and draft review in the context of review criterion
- Future plans for proposal development and submission
- Invention disclosures, patent applications and processing of intellectual property
- External faculty research awards including fellowships

Though *walk-ins* are welcome during the open-hour, faculty members are encouraged to email SVPR Atam Dhawan ([dhawan@njit.edu](mailto:dhawan@njit.edu)) about specific questions on research opportunities and needs to be discussed in advance for more detailed discussion.

The open-hour session with individuals or small groups of faculty and research staff members is expected to focus on finding research opportunities, developing collaborative teams, exploring the review criterion and reviewing program requirements. Specific proposal submission and grant management issues can be discussed with Office of Research staff separately.

Enjoy coffee/tea and cookies with SVPR over the discussion.

For any questions and additional information, please send an email to SVPR at [dhawan@njit.edu](mailto:dhawan@njit.edu).

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