# NJIT Research Newsletter

**Issue: ORN-2019-18**

***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/ .



## Special Announcements

**Faculty Seed Grant Awards**
**July 1, 2019 – June 30, 2020**

NCE

Principal Investigator: Angelo Tafuni
Department: SAET
Project Title: Simulation of Flow and Escape in the Atmosphere of Solar System Bodies

Principal Investigator: Antje Ihlefeld and Joerg Kliewer
Department: BME and ECE
Project Title: Leveraging Electro-Encephalography for Evaluating Auditory Brain Health

Principal Investigator: Ashish Borgaonkar
Department: SAET and Office of Digital Learning
Project Title: Embedding Voice Technology into Introductory Engineering Curriculum

Principal Investigator: Bruno Goncalves da Silva
Department: CEE
Project Title: Feasibility of implementing an Enhanced Geothermal System at the NJIT campus

Principal Investigator: Cong Wang
Department: ECE
Project Title: Crowdsourced Learning for Robot Physical Intelligence

Principal Investigator: Eun Jung Lee and Samuel Lieber
Department: BME and SAET
Project Title: High-throughput Cardiac Tissue Organoids for Cardiac Repair

Principal Investigator: Gennady Gor
Department: CME
Project Title: Solvation of Polypropylene Battery Separators: Expanded Ensemble Molecular Dynamics Simulations

Principal Investigator: Maciej Skotak
Department: BME
Project Title: Investigation of metabolomics profiling as a potential blood biomarker in the diagnosis of mild Traumatic Brain Injury

Principal Investigator: Namas Chandra and Venkatesan Perumal
Department/Center: CIBM3
Project Title: Development of Nanoparticle Based Apocynin to Treat

Principal Investigator: Xianlian Zhou, Sergei Adamovich and Ghaith Androwis
Department: BME and Kessler Foundation
Project Title: Design and Evaluation of Balance Controllers for a Lower Leg Exoskeleton for Rehabilitation

CSLA

Principal Investigator: Jorge Golowasch and Casey Diekman
Department: BiolS and MS
Project Title: Neuromodulation of Crustacean Circadian Clock Oscillator

Principal Investigator: Keun Ahn and Camelia Prodan
Department: PHY
Project Title: Theoretical and Experimental Studies on Edge Bands in Topological Mechanical Systems and Metamaterials

Principal Investigator: Lou Kondic and Linda Cummings
Department: MS
Project Title: Flow and Instabilities of Thin Films on Flexible Substrates

Principal Investigator: Louis Wells
Department: HUM
Project Title: Center for Applied Improvisation Workshops: Illustrating the need for the Center for Applied Improvisation and Theater

Principal Investigator: Louis Hamilton, Xinyue Ye, Margarita Vinnikov, Burcak Ozludil Altin
Department: HIST, Informatics and ADHC
Project Title: Virtual and Diffusion Analysis of the Edicole Sacre (Street Shrines) of Rome

Principal Investigator: Pier Champagne and Hao Chen
Department: CES
Project Title: Measurement of 10B/11B Kinetic Isotope Effects by Orbitrap Mass Spectrometry for the Elucidation of Organoboron Reaction Mechanisms

Principal Investigator: Rosanna Dent
Department: HIST
Project Title: Constructing a Xavante-Scientific Digital Archive

YWCC

Principal Investigator: Marvin Nakayama
Department: CS
Project Title: Randomized Quasi-Monte Carlo for Efficient Estimation of Risk

Principal Investigator: Margarita Vinnikov and Sergei Adamovich
Department: CS and BME
Project Title: Improving Serious Games for Stroke Rehabilitation with Gaze-Tracking

Principal Investigator: Amy Hoover, Marc T. Sequeira and Donald Kehoe
Department: Informatics
Project Title: Deep Computational Creativity: Combining Deep Learning Techniques for Centaur Sound Design

Principal Investigator: Usman Roshan
Department: CS
Project Title: A fully 3D convolutional neural network for automatic lesion identification in brain MRI images

Principal Investigator: Zhi Wei
Department: CS
Project Title: Model-based Deep Learning Approaches for Analysis of Genomic Data

Principal Investigator: Guiling Wang and Jo Young Lee
Department: CS and CEE
Project Title: Traffic Light Control using Multi-Agent Deep Reinforcement Learning based on Heterogeneous Data

Principal Investigator: Yvette Wohn and Hyejin Hannah Kum-Biocca
Department: CS and CoAD
Project Title: Transforming Enclosed Spaces with Augmented Reality

## Grant Opportunity Alerts

Keywords and Areas Included in the Grant Opportunity Alert Section Below

**NSF**: Computer and Information Science and Engineering (CISE) Research Initiation Initiative (CRII); Physics Frontiers Centers (PFC); Division of Chemistry: Disciplinary Research Programs (CHE-DRP), Centers for Chemical Innovation (CCI), Methodology, Measurement, and Statistics (MMS); Secure and Trustworthy Cyberspace Frontiers (SaTC Frontiers); NSF Program on Fairness in Artificial Intelligence in Collaboration with Amazon (FAI); Broadening Participation in Engineering (BPE); Sustained Availability of Biological Infrastructure (SABI) Core Program; Science and Technology Centers; Real-Time Machine Learning (RTML); Smart and Connected Communities (S&CC); Next Generation Networks for Neuroscience; Planning Grants for Engineering Research Centers (ERC); Quantum Leap Challenge Institutes (QLCI)

**NIH:** Blockchain Technology to Improve SUD Care (R43/R44); Senator Paul D. Wellstone Muscular Dystrophy Specialized Research Centers (MDSRC) (P50); PHS 2019-02 Omnibus Solicitation of the NIH, CDC, and FDA for Small Business Innovation Research Grant Applications (Parent SBIR [R43/R44]); Imaging, Biomarkers and Digital Pathomics for the Early Detection of Premetastatic Aggressive Cancer (R01); BRAIN Initiative: Focused Technology Research and Development (R01); Exploratory Research for Technology Development (R21); Tools to Facilitate High-Throughput Microconnectivity Analysis (R01); NIH Director's Pioneer Award Program (DP1); NIH Director's Transformative Research Awards (R01); Institutional Translational Research Training Program (T32); Undergraduate Research Training Initiative for Student Enhancement (U-RISE) (T34); NINDS Institutional Research Training Program (T32); Team-Based Design in Biomedical Engineering Education (R25)

**Department of Transportation:** FY 2019 National Infrastructure Investments; Pipeline Safety Research Competitive Academic Agreement Program (CAAP); Innovative Technology Deployment (HP-ITD); Dwight David Eisenhower Transportation Fellowship Program (DDETFP) Graduate Fellowship

**Department of Defense/US Army/DARPA/ONR**: Robust and Efficient Computing Architectures, Algorithms and Applications for Embedded Deep Learning; MINERVA Research Initiative, Defense Established Program to Stimulate Competitive Research (DEPSCoR); ARMY Applications Lab Broad Agency Announcement for Disruptive Applications; TrojAI; Trapped Ion Quantum Computing Systems ; Development of Quantum Algorithms; Biological Technologies; DoD Spinal Cord Injury, Investigator-Initiated Research Award; Military Medical Photonics Program ; Research Interests of the Air Force Office of Scientific Research; DoD Parkinson's Investigator-Initiated Research Award; DoD Autism Idea Development Award; Real Time Machine Learning (RTML); Science of Artificial Intelligence and Learning for Open-world Novelty (SAIL-ON); Air Force Fiscal Year 2020 Young Investigator Research Program (YIP); Multidisciplinary Research Program of the University Research Initiative (FY20 ARMY and FY AFOSR); Multidisciplinary Research Program of the University Research Initiative (ONR); Army Research Laboratory Broad Agency Announcement for Basic and Applied Scientific Research; ERDC Broad Agency Announcement

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

**EPA:** Chemical Mechanisms to Address New Challenges in Air Quality Modeling; 2019 Healthy Communities Grant Program; A National Student Design Competition Focusing on People, Prosperity and the Planet - Safe and Sustainable Water Resources

**Department of Energy**: Low Cost, Efficient Treatment Technologies For Produced Water; Buildings Energy Efficiency Frontiers & Innovation Technologies (BENEFIT) – 2019; Request for Information (RFI): Research and Development Opportunities for Building Energy Modeling; Request for Information

(RFI): Research and Development Opportunities for Innovations in Sensors and Controls for Building Energy Management
**NASA**: ROSES 2019: B.7 Space Weather Science Applications Operations 2 Research; Heliophysics Theory, Modeling, and Simulations; Astrophysics Research and Analysis; Heliophysics Data Environment Emphasis
**National Endowment of Humanities:** Digital Humanities Advancement Grants; Research and Development Program
**Samsung:** Global Research Outreach 2019
**American Diabetes Foundation**: Pathway Program
**Brain Research Foundation:** 2020 Scientific Innovation Award

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## Recent Research Grant and Contract Awards

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

**PI:** Dale Gary (PI), Haimin Wang (Co-PI), Ju Jing (Co-PI), Gregory Fleishman (Co-PI), Gelu Nita (Co-PI), Yan Xu (Co-PI)
**Department:** Center for Solar Terrestrial Research
**Grant/Contract Project Title:** Spatial Distribution of Flare-Accelerated Particles and Their Role as Seed Particles for SEPs
**Funding Agency:** NASA
**Duration:** 10/24/18-10/23/22

**PI:** Louis Lanzerotti (PI) and Andrew Gerrard (Co-PI)
**Department:** Center for Solar Terrestrial Research
**Grant/Contract Project Title:** Van Allen Probes RBSPICE Phase E Operations - Extended Missions I and II (ARDES)
**Funding Agency:** NASA
**Duration:** 07/15/16-05/13/19

**PI:** Laurent Simon (PI)
**Department:** EOP
**Grant/Contract Project Title:** Louis Stokes STEM Pathways and Research Alliance: Garden State LSAMP
**Funding Agency:** NSF
**Duration:** 03/01/19-02/29/20

**PI:** Veronica Guzman (PI)
**Department:** CPCP
**Grant/Contract Project Title:** Upward Bound for English Learners (ELLs)
**Funding Agency:** U.S. Department of Education
**Duration:** 09/01/17-08/31/20

**PI:** Monique Paden-Hutchinson (PI)
**Department:** CPCP
**Grant/Contract Project Title:** Upward Bound
**Funding Agency:** U.S. Department of Education
**Duration:** 09/01/17-08/31/20

**PI:** Monique Paden-Hutchinson (PI)
**Department:** CPCP
**Grant/Contract Project Title:** Upward Bound 2
**Funding Agency:** U.S. Department of Education
**Duration:** 09/01/17-08/31/20

**PI:** Meng Ji Loh (PI)
**Department:** Mathematical Sciences
**Grant/Contract Project Title:** Scalable Inference of Quantile Regression for Large-Scale Health Care Data
**Funding Agency:** NIH
**Duration:** 05/15/19-04/30/22

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## In the News…

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

**Advanced Computing Architecture**: This, along with algorithms and "brain-inspired processing called neuromorphic computing" is among research areas of interest to the Air Force Research Laboratory, according to Lewis-Burke Associates. See the solicitation on the FedBizOpps website. L-B also notes a proposers' day (May 29) announcement by the Intelligence Advanced Research Projects Activity (IARPA) for the Space-Based Machine Automated Recognition Technique (SMART) Program. The agency, the R&D arm of the intelligence community, says SMART's primary objective is to "develop tools and techniques to automatically and dynamically execute broad-area search (BAS) over diverse environments to detect construction and other anthropogenic activities (e.g., heavy building and highway construction) using time-series spectral imagery." Please see the Grant Opportunity section below for information about the solicitation.

**Future CONVERGENCE:** The National Science Foundation seeks information on future convergence accelerator tracks. These could be within two of NSF's Big Ideas--Harnessing the Data Revolution and the Future of Work at the Human-Technology Frontier--but they also could be "within other Big Ideas, or on other topics that may not relate directly to a Big Idea but that may have national impact." Learn more.

**House Panel Approves 5.1 Percent Increase For NIH**: Legislation increases discretionary funding by $11.7 billion from the 2019 level, investing in education, health care, medical research, and job training so people have a better chance at a better life; Bill funds firearm injury and mortality prevention research at CDC for first time in more than 20 years. Appropriators bounded from the starting gate this week with a $189.8 billion FY 2020 Labor-HHS-Education spending bill containing $41.1 billion for the National Institutes of Health--$2 billion above the current enacted level. The White House had sought to slash $6.9.billion from the agency. Saying the president's proposals "do not reflect the values of this country," Rep. Rosa DeLauro (D-Conn.), subcommittee chair (right photo), said the Labor-HHS measurebuilds on bipartisan collaboration over the previous two years, when the panel was chaired by Rep. Tom Cole (R-Okla.). The NIH portion provides a nearly 5 percent increase for each institute as well as $500 million for precision medicine research and $411 million for the BRAIN initiative, both areas of interest to engineers.

For higher education, the bill increases the maximum Pell Grant award by $150, provides $917 million for colleges and universities that primarily serve communities of color, and contains "a new $150 million investment in our community colleges and other four-year college partners to help train workers for in-demand industries;" DeLauro said. The full Appropriations Committee takes up the measure May 8, when it is also expected to approve 302(b) suballocations for all 12 spending bills, CQ has reported. The White House Committee on Appropriations release is posted on the website https://appropriations.house.gov/news/press-releases/appropriations-committee-releases-fiscal-year-2020-labor-hhs-education-funding

**DoE Issues FRPs on AI Geared to Scientific Research:** The Department of Energy's Office of Science has $13 million available for new research aimed at improving artificial intelligence as a tool of scientific investigation and prediction. "Of this $13 million, $11 million is bookmarked for the development of new AI algorithms and software adapted to specific scientific problems, or sets of problems." The RFPs ae posted in the Grant Opportunities section below and the DoE website https://science.energy.gov/ascr/funding-opportunities/.

**Air Force YIP Program:** The Air Force Young Investigator Program (YIP) plans to make awards of up to $450,000 to career scientists and engineers who have received Ph.D. or equivalent degrees by 1 April 2012 or later and who show "exceptional ability and promise for conducting basic research." The deadline for applications is June 3. More information is included in the Grant Opportunity section and on the website https://www.grants.gov/web/grants/view-opportunity.html?oppId=313523

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## Webinar and Events

**Event: CBET CAREER Webinar**
**Sponsor: NSF**
**When: May 15, 2019; 1.00 PM – 3.00 PM**
**Website:** https://www.nsf.gov/events/event_summ.jsp?cntn_id=244850&org=NSF
**Brief Description:** The NSF Division of Chemical, Bioengineering, Environmental, and Transport Systems (CBET) will host a CAREER Proposal Webinar, Wednesday, May 15, 2019, 1-3 pm eastern time, to review CBET programs and to share best practices regarding the development of proposals to the CAREER program.
The agenda will include:

- CAREER solicitation overview
- Overview of CBET programs
- Question and answer session with CBET program officers

**To join the Webex meeting**: Register in advance for this WebEx event.

**Event: Webcast: Information Complexity and Applications**
**Sponsor: NSF**
**When: May 15, 2019 at 3:00 PM EDT**
**Website:** https://www.nsf.gov/events/event_summ.jsp?cntn_id=298463&org=NSF
**Brief Description: Abstract**: Over the past two decades, information theory has reemerged within computational complexity theory as a mathematical tool for obtaining tight unconditional bounds in a number of models, including streaming algorithms, data structures, and communication complexity. Many of these applications can be systematized and extended via the study of information complexity — which treats information revealed or transmitted as the resource to be conserved. In this talk we will

discuss the two-party information complexity and its properties — and the interactive analogues of classical source coding theorems. We will then discuss applications to exact bounds in a number of models, as well as current challenges and extensions.
**Bio**: Mark Braverman is a Professor of Computer Science at Princeton University, having joined the department in 2011 from the University of Toronto, where he was an assistant professor in the mathematics and computer science departments. He earned his Ph.D. in 2008 from Toronto and did post-doctoral research at Microsoft Research New England, Cambridge, MA. Professor Braverman's interests center on the connections between theoretical computer science and other disciplines, including information theory, mathematics, and economics. Most recently, he has been building new connections between information theory and complexity theory, studying the effects of noise in a variety of computational settings, and investigating how better algorithms can lead to better mechanism design, particularly in the context of healthcare. He was awarded an EMS Prize in 2016 from the European Mathematical Society, a Presburger Award in the same year, as well as the 2019 Alan T. Waterman Award from NSF.
**To Join the Webinar:** Please register at: http://www.tvworldwide.com/events/nsf/190515/

**Event: An 'amazing opportunity' - Women in IT Networking at SC (WINS)**
**Sponsor: NSF**
**When: May 16, 2019; 2.00 PM – 3.00 PM**
**Website:** https://www.nsf.gov/events/event_summ.jsp?cntn_id=298508&org=NSF
**Brief Description:** The Women in IT Networking at SC (WINS) program was developed to address the gender gap prevalent in information technology, especially in network engineering and high performance computing. Originally introduced as a pilot program at SC15, the program provides mentorship and travel funding for up to 5-8 talented early to mid-career women from diverse regions of the U.S. research and education IT community for a true "hands on" experience in the ground-up construction of SCinet, one of the fastest and most advanced computer networks in the world. SCinet, the Supercomputing Conference's (SC) dedicated high-performance research network, provides an ideal "apprenticeship" opportunity for engineers and technologists looking for direct access to the most cutting-edge network hardware and software, while working side-by-side with the world's leading network and software engineers, and the top network technology vendors. Since the WINS program started in 2015, it has had a significant impact on diversity of the SCinet team. WINS is a joint effort between the Energy Sciences Network (ESnet), KINBER, and the University Corporation for Atmospheric Research (UCAR). It is funded by an NSF grant and, through ESnet, by the Department of Energy.
**To join the Webex meeting**: Plan to join us on Thursday May 16, 2019 at 2pm by registering at: https://nsf2.webex.com/nsf2/onstage/g.php?MTID=ea7682188ed36688b7362b2b147e29138

**Event: NSF Distinguished Lecture Series in Mathematical and Physical Sciences**
**Sponsor: National Academies**
**When: May 20, 2019 from 2.00 PM**
**Website:** http://sites.nationalacademies.org/deps/bmsa/deps_183972
**Brief Description:**
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).

**Event: I-Corps Bio-Entrepreneurship Workshop**
**Sponsor: UNH ICorps**
**When: June 2-5, 2019; Applications are due Monday, April 15 at 5 PM eastern time**
**Website:** https://innovation.unh.edu/icorps/i-corps-bio-entrepreneurship-workshop
**Brief Description:** The United Negro College Fund, the National Science Foundation, the Biotechnology Innovation Organization (BIO), the Ernest E. Just Institute for the Life Sciences, University of New Hampshire I-Corps, CSU I-Corps, MIT I-Corps, and Penn I-Corps have partnered to offer a Bio-Entrepreneurship Workshop during the Biotechnology International Conference (BIO 2019; convention.bio.org) in Philadelphia, Pennsylvania June 2-5, 2019. A 3-day I-Corps Bio-Entrepreneurship Workshop, including BIO International Convention exhibition access. Work on teams with industry mentors to learn about biotechnology commercialization, grow your professional network, and explore entrepreneurial opportunities that build on basic research.

Early-career life science researchers from groups underrepresented in biotechnology research organizations. Research-active undergraduate and graduate students, postdoctoral fellows, and assistant professors from universities and colleges nationwide are eligible to participate. Researchers from Historically Black Colleges and Universities, Hispanic Serving Institutions, Tribal Colleges and Universities, and minority-serving institutions are especially encouraged to apply.

**Event: EHR CAREER Webinar**
**Sponsor: NSF**
**When: June 3, 2019; 3.00 PM – 4.30 PM**
**Website:** https://www.nsf.gov/events/event_summ.jsp?cntn_id=298514&org=NSF
**cription:** The webinar will provide an overview of the issues to consider for PIs planning to submit a CAREER proposal to the Directorate for Education and Human Resources. Time is allotted for Q&A at the end of the presentation.
**To join the Webex meeting**:
When it's time, join the meeting.
Meeting Number (access code): 902 614 365
Meeting Password: EHRCAReeR2!!
Join by Phone: 1-510-210-8882

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## Grant Opportunities

### National Science Foundation

**Grant Program: Computer and Information Science and Engineering (CISE) Research Initiation Initiative (CRII)**
**Agency: National Science Foundation NSF 19-579**
**RFP Website**: https://www.nsf.gov/pubs/2019/nsf19579/nsf19579.htm
**Brief Description:** The NSF Directorate for Computer and Information Science and Engineering (CISE) seeks to award grants intended to support research independence among early-career academicians who specifically lack access to adequate organizational or other resources. It is expected that funds obtained through this program will be used to support untenured faculty or research scientists (or equivalent) in their first three years in a primary academic position after the PhD, but not more than five years after completion of their PhD. Applicants for this program may not yet have received any other grants or contracts in the PI role from any department, agency, or institution of the federal government, including from the CAREER program or any other program, post-PhD, regardless of the size of the grant or contract,

with certain exceptions as noted below. Serving as co-PI, Senior Personnel, Postdoctoral Fellow, or other Fellow does not count against this eligibility rule.

Importantly, the CRII program seeks to provide essential resources to enable early-career PIs to launch their research careers. For the purposes of this program, CISE defines "essential resources" as those that (a) the PI does not otherwise have, including through organizational or other funding and (b) are critical for the PI to conduct early-career research that will enable research independence. In particular, this program is not appropriate for PIs who already have access to resources to conduct any early-career research.

It is expected that these funds will allow the new CRII PI to support one or more graduate students for up to two years. Faculty at undergraduate and two-year institutions may use funds to support undergraduate students, and may use the additional RUI designation (which requires inclusion of a RUI Impact Statement) -- see https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5518 for additional information. In addition, submissions from all institutions may use funds for postdoctoral scholars, travel, and/or research equipment.

**Awards:** Standard Grant. Each award will be up to $175,000 for a period of 24 months. Anticipated Funding: $10,000,000.

**Letter of Intent:** Not Required

**Proposal Submission Deadline:** August 14, 2019

**Contacts:** Almadena Y. Chtchelkanova, Program Director, CCF, telephone: (703) 292-8910, email: achtchel@nsf.gov

- Ephraim P. Glinert, Program Director, IIS, telephone: (703) 292-8930, email: eglinert@nsf.gov
- Mimi McClure, Associate Program Director, CNS, telephone: (703) 292-8950, email: mmcclure@nsf.gov
- Alan Sussman, Program Director, telephone: (703) 292-8970, email: alasussm@nsf.gov

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**Grant Program: Physics Frontiers Centers (PFC)**

**Agency: National Science Foundation NSF 19-578**

**RFP Website**: https://www.nsf.gov/pubs/2019/nsf19578/nsf19578.htm

**Brief Description:** The Physics Frontiers Centers (PFC) program supports university-based centers and institutes where the collective efforts of a larger group of individuals can enable transformational advances in the most promising research areas. The program is designed to foster major breakthroughs at the intellectual frontiers of physics by providing needed resources such as combinations of talents, skills, disciplines, and/or specialized infrastructure, not usually available to individual investigators or small groups, in an environment in which the collective efforts of the larger group can be shown to be seminal to promoting significant progress in the science and the education of students. Activities supported through the program are in all sub-fields of physics within the purview of the Division of Physics: atomic, molecular, optical, plasma, elementary particle, nuclear, particle astro-, gravitational, and biological physics. Interdisciplinary projects at the interface between these physics areas and other disciplines and physics sub-fields may also be considered, although the bulk of the effort must fall within one of those areas within the purview of the Division of Physics. The successful PFC activity will demonstrate: (1) the potential for a profound advance in physics; (2) creative, substantive activities aimed at enhancing education, diversity, and public outreach; (3) potential for broader impacts, e.g., impacts on other field(s) and benefits to society; (4) a synergy or value-added rationale that justifies a center- or institute-like approach.

**Awards:** Cooperative Agreement. Anticipated Funding: $8,000,000. Individual PFC awards are expected to range in size between $1.0 million/year and $5.0 million/year. The number of awards in FY 2020 is expected to be in the range 3-5, depending upon the availability of funds and the quality of proposals received. Awards will be made for five years, with an option for a one-year extension.

**Letter of Intent:** Not Required
**Limit on Number of Proposals per Organization:** 2; No more than two preliminary proposals may be submitted by any one institution. The same limitation applies to full proposals.
**Preliminary Proposal Due Date(s) *(required)* (due by 5 p.m. submitter's local time):** August 01, 2019
**Full Proposal Deadline(s) (due by 5 p.m. submitter's local time):** January 30, 2020; by invitation only.
**Contacts:** Jean Cottam Allen, Program Director, telephone: (703) 292-8783, email: jcallen@nsf.gov

- Kathleen McCloud, Program Director, telephone: (703) 292-8236, email: kmccloud@nsf.gov

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**Grant Program: Division of Chemistry: Disciplinary Research Programs (CHE-DRP)**
**Agency: National Science Foundation NSF 19-577**
**RFP Website**: https://www.nsf.gov/pubs/2019/nsf19577/nsf19577.htm
**Brief Description:** This solicitation applies to nine CHE Disciplinary Chemistry Research Programs: Chemical Catalysis (CAT); Chemical Measurement and Imaging (CMI); Chemical Structure, Dynamics and Mechanisms-A (CSDM-A); Chemical Structure Dynamics and Mechanisms-B (CSDM-B); Chemical Synthesis (SYN); Chemical Theory, Models and Computational Methods (CTMC); Chemistry of Life Processes (CLP); Environmental Chemical Sciences (ECS); and Macromolecular, Supramolecular and Nanochemistry (MSN).
All proposals submitted to these nine CHE Disciplinary Research Programs (other than the following exceptions) must be submitted through this solicitation, otherwise they will be returned without review.
Exceptions:

- Faculty Early Career Development Program (CAREER) proposals should be submitted through the CAREER solicitation (https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503214) by the CAREER deadline date specified.
- Facilitating Research at Primarily Undergraduate Institutions: Research in Undergraduate Institutions (RUI) and Research Opportunity Awards (ROA) proposals should be submitted through the RUI/ROA solicitation (https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5518) during the window for the appropriate CHE Disciplinary Research Program. In addition to the requirements of the RUI program, proposals should follow the guidance in this solicitation.
- Proposals for Early-concept Grants for Exploratory Research (EAGER), Grants for Rapid Response Research (RAPID), Research Advanced by Interdisciplinary Science and Engineering (RAISE), and conferences can be submitted anytime after consultation with the cognizant NSF Program Officer.
- Supplemental funding requests to existing grants can be submitted anytime after consultation with the cognizant NSF Program Officer.

**Awards:** Standard Grant. Anticipated Funding: $150,000,000.
**Letter of Intent:** Not Required
**Proposal Submission Deadline:** September 01, 2019 - September 30, 2019
**Contacts:** For CTMC: Evelyn Goldfield, telephone: (703) 292-2173, email: egoldfie@nsf.gov

- For CLP: Catalina Achim, telephone: (703) 292-2048, email: cachim@nsf.gov
- For CSDM-A: Colby A. Foss, telephone: (703) 292-5327, email: cfoss@nsf.gov
- For CMI: Kelsey D. Cook, telephone: (703) 292-7490, email: kcook@nsf.gov
- For CSDM-B: Tingyu Li, telephone: (703) 292-4949, email: tli@nsf.gov

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**Grant Program: Centers for Chemical Innovation (CCI): Phase I Awards and New/Renewal Phase II Centers**
**Agency: National Science Foundation NSF 19-576**
**RFP Website**: https://www.nsf.gov/pubs/2019/nsf19576/nsf19576.htm

**Brief Description:** The Centers for Chemical Innovation (CCI) Program supports research centers focused on major, long-term fundamental chemical research challenges. CCIs that address these challenges will produce transformative research, lead to innovation, and attract broad scientific and public interest. CCIs are agile structures that can respond rapidly to emerging opportunities through enhanced collaborations. CCIs integrate research, innovation, education, broadening participation, and informal science communication.

The CCI Program is a two-phase program. Both phases are described in this solicitation. Phase I CCIs receive significant resources to develop the science, management and broader impacts of a major research center before requesting Phase II funding. Satisfactory progress in Phase I is required for Phase II applications; Phase I proposals funded in FY 2020 will seek Phase II funding in FY 2023. The FY 2020 Phase I CCI competition is open to projects in all fields supported by the Division of Chemistry, and must have scientific focus and the potential for transformative impact in chemistry. *NSF Chemistry particularly encourages fundamental chemistry projects related to one or more of NSF's 10 Big Ideas.*

The FY 2020 Phase II CCI competition is open to projects funded as Phase I awards in FY 2017 and the renewal of the Center for Sustainable Nanotechnology.

**Awards:** Standard Grant. Anticipated Funding: $17,400,000.

**Letter of Intent:** Not Required

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

August 13, 2019: Phase I Preliminary Proposals

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

October 16, 2019: Phase II Full Proposals, New and Renewal

February 19, 2020: Phase I Full Proposals, by invitation only

**Contacts:** Michelle M. Bushey, telephone: (703) 292-4938, email: mbushey@nsf.gov

- Katharine J. Covert, telephone: (703) 292-4950, email: kcovert@nsf.gov
- Colby A. Foss, telephone: (703) 292-5327, email: cfoss@nsf.gov

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**Grant Program: Methodology, Measurement, and Statistics (MMS)**

**Agency: National Science Foundation NSF 19-575**

**RFP Website**: https://www.nsf.gov/pubs/2019/nsf19575/nsf19575.htm

**Brief Description:** The Methodology, Measurement, and Statistics (MMS) Program is an interdisciplinary program in the Directorate for Social, Behavioral, and Economic Sciences that supports the development of innovative analytical and statistical methods and models for those sciences. MMS seeks proposals that are methodologically innovative, grounded in theory, and have potential utility for multiple fields within the social, behavioral, and economic sciences. As part of its larger portfolio, the MMS Program partners with a consortium of federal statistical agencies to support research proposals that further the production and use of official statistics.

The MMS Program provides support through a number of different funding mechanisms. The following mechanisms are addressed in this solicitation:

- Regular Research Awards
- Awards for conferences and community-development activities
- Doctoral Dissertation Research Improvement (DDRI) Grants
- Research Experience for Undergraduates (REU) Supplements

MMS also supports Faculty Early Career Development (CAREER) awards. Please see the CAREER Program Web Site for more information about this activity.

**Awards:** Standard Grant. Anticipated Funding: $3,760,000.

**Letter of Intent:** Not Required

**Proposal Submission Deadline:** August 29, 2019

**Contacts:** Cheryl L. Eavey - Program Director, telephone: (703) 292-7269, email: ceavey@nsf.gov

- Liana A. Denola - Social Scientist, telephone: (703) 292-2675, email: ldenola@nsf.gov
- Robbie W. Brown - Program Specialist, telephone: (703) 292-7264, email: rbrown@nsf.gov

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**Grant Program: Secure and Trustworthy Cyberspace Frontiers (SaTC Frontiers)**
**Agency: National Science Foundation NSF 19-572**
**RFP Website**: https://www.nsf.gov/pubs/2019/nsf19572/nsf19572.htm
**Brief Description:** In today's increasingly networked, distributed, and asynchronous world, cybersecurity involves hardware, software, networks, data, people, and integration with the physical world. Society's overwhelming reliance on this complex cyberspace, however, has exposed its fragility and vulnerabilities that defy existing cyber-defense measures; corporations, agencies, national infrastructure and individuals continue to suffer cyber-attacks. Achieving a truly secure cyberspace requires addressing both challenging scientific and engineering problems involving many components of a system, and vulnerabilities that stem from human behaviors and choices. Examining the fundamentals of security and privacy as a multidisciplinary subject can lead to fundamentally new ways to design, build and operate cyber systems, protect existing infrastructure, and motivate and educate individuals about cybersecurity. The Secure and Trustworthy Cyberspace (SaTC) program welcomes proposals that address cybersecurity and privacy, and draw on expertise in one or more of these areas: computing, communication and information sciences; engineering; economics; education; mathematics; statistics; and social and behavioral sciences. Proposals that advance the field of cybersecurity and privacy within a single discipline or interdisciplinary efforts that span multiple disciplines are both encouraged. Please see SaTC program solicitation for more details.

Through this solicitation—under the SaTC umbrella—NSF specifically seeks ambitious and potentially transformative **center-scale projects** in the area of security and privacy that (1) catalyze far-reaching research explorations motivated by deep scientific questions or hard problems and/or by compelling applications and novel technologies that promise significant scientific and/or societal benefits, and (2) stimulate significant research and education outcomes that, through effective knowledge transfer mechanisms, promise scientific, economic and/or other societal benefits. The goal of the SaTC Frontiers program is to advance the frontiers of cybersecurity and privacy, and the areas listed in the SaTC program solicitation are meant to be illustrative but not exhaustive.
**Awards:** Continuing Grant. The SaTC Frontiers program will support proposals from $5,000,000 to $10,000,000 in total budget, with durations of up to five years. Anticipated Funding: $15,000,000.
**Letter of Intent:** July 05, 2019
**Proposal Submission Deadline:** September 30, 2019
**Contacts:** Nina Amla, Program Director, CISE/CCF, telephone: (703) 292-7991, email: namla@nsf.gov
- Shannon I. Beck, Associate Program Director/Program Coordinator, CISE/CNS, telephone: (703) 292-2487, email: sbeck@nsf.gov
- Dan R. Cosley, Program Director, CISE/IIS, telephone: (703) 292-8491, email: dcosley@nsf.gov

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**Grant Program: Fairness in Artificial Intelligence in Collaboration with Amazon (FAI)**
**Agency: National Science Foundation NSF 19-571**
**RFP Website**: https://www.nsf.gov/pubs/2019/nsf19571/nsf19571.htm?WT.mc_id=USNSF_179
**Brief Description:** NSF has long supported transformative research in artificial intelligence (AI) and machine learning (ML). The resulting innovations offer new levels of economic opportunity and growth, safety and security, and health and wellness. At the same time, broad acceptance of large-scale deployments of AI systems relies critically on their trustworthiness which, in turn, depends upon the collective ability to ensure, assess, and ultimately demonstrate the fairness, transparency, explainability,

and accountability of such systems. Importantly, the beneficial effects of AI systems should be broadly available across all segments of society.

NSF and Amazon are partnering to jointly support computational research focused on fairness in AI, with the goal of contributing to trustworthy AI systems that are readily accepted and deployed to tackle grand challenges facing society. Specific topics of interest include, but are not limited to transparency, explainability, accountability, potential adverse biases and effects, mitigation strategies, validation of fairness, and considerations of inclusivity. Funded projects will enable broadened acceptance of AI systems, helping the U.S. further capitalize on the potential of AI technologies. Although Amazon provides partial funding for this program, it will not play a role in the selection of proposals for award.

Advancing AI is a highly interdisciplinary endeavor drawing on fields such as computer science, information science, engineering, statistics, mathematics, cognitive science, and psychology. As such, NSF and Amazon expect these varied perspectives to be critical for the study of fairness in AI. NSF's ability to bring together multiple scientific disciplines uniquely positions the agency in this collaboration, while building AI that is fair and unbiased is an important aspect of Amazon's AI initiatives. This program supports the conduct of fundamental computer science research into theories, techniques, and methodologies that go well beyond today's capabilities and are motivated by challenges and requirements in real systems.

**Awards:** Standard and Continuing Grants. $750,000 - up to a maximum of $1,250,000 for periods of up to 3 years. Anticipated Funding: $7,600,000.

**Letter of Intent:** May 10, 2019

**Proposal Submission Deadline:** June 25, 2019

**Contacts:** Todd Leen, Program Director, CISE/IIS, telephone: (703) 292-8930, email: tleen@nsf.gov

- Sylvia Spengler, Program Director, CISE/IIS, telephone: (703) 292-8930, email: sspengle@nsf.gov

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**Grant Program: Broadening Participation in Engineering (BPE)**
**Agency: National Science Foundation PD 19-7680**
**RFP Website**:
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505632&org=NSF&sel_org=NSF&from=fund

**Brief Description:** NSF seeks to strengthen the future U.S. Engineering workforce by enabling the participation of all citizens through the support of research in the science of Broadening Participation in Engineering (BPE). The BPE program is a dedicated to supporting the development of a diverse and well-prepared engineering workforce. BPE focuses on enhancing the diversity and inclusion of all underrepresented populations in engineering, including gender identity and expression, race and ethnicity (African Americans/Blacks, Hispanic Americans, American Indians, Alaska Natives, Native Hawaiians, and Native Pacific Islanders), disability, LGBTQ+, first generation college and socio-economic status.
BPE funds research to

- Understand and analyze the systemic barriers that prevent underrepresented groups from pursuing and succeeding in engineering, for example, understand the problem of insufficient interest and poorly sustained participation in engineering across underrepresented demographic groups; insignificant preparation and scarce opportunities for members of underrepresented groups to learn meaningful, relevant engineering content.
- Understand and analyze factors that enhance our ability to increase access to engineering by creating support systems and social networks that raise career awareness about different engineering pathways.
- Develop innovative methods and projects to significantly impact the recruitment and retention of engineering students from underrepresented groups. Activities must be supported by relevant data and have the capability to produce a model that can be replicated in other contexts.

- Develop innovative methods and projects to aggressively recruit and retain tenure track faculty from underrepresented groups.
- Design and transform culture to make diversity, equity, and inclusion a priority in the engineering enterprise.

BPE research activities will provide scientific evidence that engineering educators, employers, and policy makers need to make informed decisions to design effective programs that broaden the participation of persons from historically underrepresented groups in the engineering workforce. BPE is interested in funding research that spans K-12 to workforce and offers the greatest return on investment. BPE funded research should produce outcomes that are scalable, sustainable, and applicable to various contexts, settings, and demographics within the engineering enterprise. BPE is particularly interested in research that employs intersectional approaches in recognition that gender, race and ethnicity do not exist in isolation from each other and from other categories of social identity.

**Awards:** Average award is $350,000 for 36 months
**Letter of Intent:** Not required
**Proposal Submission Deadline:** No deadline
**Contacts:** Paige E. Smith psmith@nsf.gov 703-292-7107

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**Grant Program: Sustained Availability of Biological Infrastructure (SABI) Core Program**
**Agency: National Science Foundation NSF 19-569**
**RFP Website**: https://www.nsf.gov/pubs/2019/nsf19569/nsf19569.htm
**Brief Description:** The Sustained Availability of Biological Infrastructure program (SABI) supports the continued operation of extant infrastructure that will advance basic biological research. Infrastructure supported under this program may include cyberinfrastructure, instrumentation, experimental or observational facilities, biological living stocks which have ongoing costs of operation and maintenance that exceed the reasonable capacity of the host institution. Proposals must make a compelling case that sustained availability of the proposed infrastructure will advance or transform research in biological sciences as supported by the National Science Foundation.

While other programs in the Division of Biological Infrastructure focus on research leading to future infrastructure or on the development or implementation of shared infrastructure, this program focuses on awards that ensure the continued availability of mature infrastructure resources critical to sustain the ability of today's scientific community to conduct leading edge research. Awards made through this program are expected to lead to novel, impactful, and transformative science outcomes through research activities enabled by their use. Infrastructure that demonstrates substantial impact on research supported by the Directorate for Biological Sciences and its collaborating organizations is eligible for support under this program.

**Awards:** Standard and Continuing Grants. Anticipated Funding: $5,000,000.
**Letter of Intent:** Not required
**Proposal Submission Deadline:** Proposals Accepted Anytime
**Contacts:** Peter H. McCartney, telephone: (703) 292-8470, email: pmccartn@nsf.gov

- Roland P. Roberts, telephone: (703) 292-7884, email: rolrober@nsf.gov
- Reed S. Beaman, telephone: (703) 292-7163, email: rsbeaman@nsf.gov

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**Grant Program: Science and Technology Centers: Integrative Partnerships**
**Agency: National Science Foundation NSF 19-567**
**RFP Website**: https://www.nsf.gov/pubs/2019/nsf19567/nsf19567.htm
**Brief Description:** The Science and Technology Centers (STC): Integrative Partnerships program supports exceptionally innovative, complex research and education projects that require large-scale, long-

term awards. STCs focus on creating new scientific paradigms, establishing entirely new scientific disciplines and developing transformative technologies which have the potential for broad scientific or societal impact. STCs conduct world-class research through partnerships among institutions of higher education, national laboratories, industrial organizations, other public or private entities**,** and via international collaborations, as appropriate. They provide a means to undertake potentially groundbreaking investigations at the interfaces of disciplines and/or highly innovative approaches within disciplines. STCs may involve any area of science and engineering that NSF supports. STC investments support the NSF vision of creating and exploiting new concepts in science and engineering and providing global leadership in research and education. Centers provide a rich environment for encouraging future scientists, engineers, and educators to take risks in pursuing discoveries and new knowledge. STCs foster excellence in education by integrating education and research, and by creating bonds between learning and inquiry so that discovery and creativity fully support the learning process.

NSF expects STCs to demonstrate leadership in the involvement of groups traditionally underrepresented in science and engineering at all levels (faculty, students, and postdoctoral researchers) within the Center. Centers use either proven or innovative mechanisms to address issues such as recruitment, retention and mentorship of participants from underrepresented groups. Centers must undertake activities that facilitate knowledge transfer, i.e., the exchange of scientific and technical information with the objective of disseminating and utilizing knowledge broadly in multiple sectors. Examples of knowledge transfer include technology transfer, providing key information to public policy-makers, or dissemination of knowledge from one field of science to another.

The STC program supports potentially groundbreaking investigations at the interfaces of disciplines or highly innovative approaches within disciplines. STCs may involve any area of science and engineering that NSF supports. STCs exploit opportunities in science, engineering and technology where the complexity of the research agenda requires the duration, scope, scale, flexibility, and facilities that center support can provide. They help enable U.S. leadership in research in a world in which discovery, learning, and innovation enterprises are increasingly interconnected and increasingly global**.** Centers offer the science and engineering community a venue for developing effective mechanisms to integrate scientific and technological research and education activities; to explore better and more effective ways to educate students; to broaden participation of underrepresented groups; and to ensure the timely transfer of research and education advances made in service to society. STC partner organizations work together with the lead institution as an integrated whole to achieve the shared research, education, broadening participation, and knowledge-transfer goals of the Center.

**Awards:** Cooperative Agreements. Anticipated Funding: $25,000,000; Up to 5 awards in FY2021

**Letter of Intent:** Not required

**Preliminary Proposals:** Submission of Preliminary Proposals is required by June 25, 2019

**Proposal Submission Deadline:** January 27, 2020

**Limit on Number of Proposals per Organization: 3**

A single organization may submit a maximum of three preliminary proposals as the lead institution. Full proposals are to be submitted only when invited by NSF. There is no limit on the number of proposals in which an organization participates as a partner institution. The STC program will not support more than one Center from any one lead institution in this competition.

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

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**Grant Program: Real-Time Machine Learning (RTML)**

**Agency: National Science Foundation NSF 19-566**

**RFP Website**: https://www.nsf.gov/pubs/2019/nsf19566/nsf19566.htm

**Brief Description:** A grand challenge in computing is the creation of machines that can proactively interpret and learn from data in real time, solve unfamiliar problems using what they have learned, and

operate with the energy efficiency of the human brain. While complex machine-learning algorithms and advanced electronic hardware (henceforth referred to as 'hardware') that can support large-scale learning have been realized in recent years and support applications such as speech recognition and computer vision, emerging computing challenges require real-time learning, prediction, and automated decision-making in diverse domains such as autonomous vehicles, military applications, healthcare informatics and business analytics.

A salient feature of these emerging domains is the large and continuously streaming data sets that these applications generate, which must be processed efficiently enough to support real-time learning and decision making based on these data. This challenge requires novel hardware techniques and machine-learning architectures. This solicitation seeks to lay the foundation for next-generation co-design of RTML algorithms and hardware, with the principal focus on developing novel hardware architectures and learning algorithms in which all stages of training (including incremental training, hyperparameter estimation, and deployment) can be performed in real time.

The National Science Foundation (NSF) and the Defense Advanced Research Projects Agency (DARPA) are teaming up through this Real-Time Machine Learning (RTML) program to explore high-performance, energy-efficient hardware and machine-learning architectures that can learn from a continuous stream of new data in real time, through opportunities for post-award collaboration between researchers supported by DARPA and NSF.

**Awards:** Continuing Grants. Anticipated Funding: $10,000,000.

**Letter of Intent:** Not required

**Proposal Submission Deadline:** June 6, 2019

**Contacts:** Sankar Basu, telephone: (703) 292-7843, email: sabasu@nsf.gov

- Jenshan Lin, telephone: (703) 292-7950, email: jenlin@nsf.gov

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**Grant Program: Smart and Connected Communities (S&CC)**

**Agency: National Science Foundation NSF 19-564**

**RFP Website**: https://www.nsf.gov/pubs/2019/nsf19564/nsf19564.htm

**Brief Description:** Communities in the United States (US) and around the world are entering a new era of transformation in which residents and their surrounding environments are increasingly connected through rapidly-changing intelligent technologies. This transformation offers great promise for improved wellbeing and prosperity but poses significant challenges at the complex intersection of technology and society. The goal of the NSF Smart and Connected Communities (S&CC) program solicitation is to accelerate the creation of the scientific and engineering foundations that will enable smart and connected communities to bring about new levels of economic opportunity and growth, safety and security, health and wellness, and overall quality of life.

For the purposes of this solicitation, communities are defined as having geographically-delineated boundaries—such as towns, cities, counties, neighborhoods, community districts, rural areas, and tribal regions—consisting of various populations, with the structure and ability to engage in meaningful ways with proposed research activities. A "smart and connected community" is, in turn, defined as a community that synergistically integrates intelligent technologies with the natural and built environments, including infrastructure, to improve the social, economic, and environmental well-being of those who live, work, or travel within it.

The S&CC program encourages researchers to work with communities and residents to identify and define challenges they are facing, enabling those challenges to motivate use-inspired research questions. The S&CC program **supports integrative research that addresses fundamental technological and social science dimensions of smart and connected communities** and pilots solutions together with communities. Importantly, the program is interested in projects that consider the sustainability of the research outcomes beyond the life of the project, including the scalability and transferability of the proposed solutions.

This S&CC solicitation will support research projects in the following categories:

- **S&CC Integrative Research Grants (SCC-IRGs) Tracks 1 and 2.** Awards in this category will support fundamental integrative research that addresses technological and social science dimensions of smart and connected communities and pilots solutions together with communities. Track 1 is for budgets greater than $1,500,000 with no recommended budget limit, and for up to four years of support. Track 2 is for budgets not to exceed $1,500,000, and for up to three years of support.
- **S&CC Planning Grants (SCC-PGs).** Awards in this category are for capacity building to prepare project teams to propose future well-developed SCC-IRG proposals. Each of these awards will provide support for a period of one year and may be requested at a level not to exceed $150,000 for the total budget.

S&CC is a cross-directorate program supported by NSF's Directorates for Computer and Information Science and Engineering (CISE), Education and Human Resources (EHR), Engineering (ENG), and Social, Behavioral, and Economic Sciences (SBE).

**Awards:** 35 to 40 Standard Grants. Anticipated Funding: $43,000,000. The planning grant is for one year and the proposed budget for each planning grant should not exceed $150,000.

**Letter of Intent:** August 6, 2019

**Proposal Submission Deadline:** September 6, 2019

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

- Radhakishan Baheti, Program Director, ENG/ECCS, telephone: (703) 292-8339, email: rbaheti@nsf.gov
- Wendy Nilsen, Program Director, CISE/IIS, telephone: (703) 292-2568, email: wnilsen@nsf.gov

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**Grant Program: Next Generation Networks for Neuroscience (NeuroNex): Technology-enabled, Team-based Neuroscience**

**Agency: National Science Foundation NSF 19-563**

**RFP Website**: https://www.nsf.gov/pubs/2019/nsf19563/nsf19563.htm

**Brief Description:** Understanding how behavior emerges from the dynamic patterns of electrical and chemical activity of brain circuits is universally recognized as one of the great, unsolved mysteries of science. Advances in recent decades have elucidated how individual elements of the nervous system and brain relate to specific behaviors and cognitive processes. However, there remains much to discover to attain a comprehensive understanding of how the healthy brain functions, specifically, the general principles underlying how cognition and behavior relate to the brain's structural organization and dynamic activities, how the brain interacts with its environment, and how brains maintain their functionality over time. Achieving an understanding of brain structure and function that spans levels of organization, spatial and temporal scales, and the diversity of species requires an international, transdisciplinary collaborative effort to not only integrate discipline-specific ideas and approaches but also extend them to stimulate new discoveries, and innovative concepts, theories, and methodologies.

The objective of this phase of the NeuroNex Program is the establishment of distributed, international research networks that build on existing global investments in neurotechnologies to address overarching questions in neuroscience. The creation of such global research networks of excellence will foster international cooperation by seeding close interactions between a wide array of organizations across the world, as well as creating links and articulating alliances between multiple recently launched international brain projects. The potential transformative advances in neuroscience stemming from this activity will have profound scientific and societal impacts.

The goal of this solicitation is to support collaborative networks (approximately 15 to 20 investigators in each network) comprised of international teams of disciplinarily diverse experimentalists,

theorists, and research resource (including technology and cyberinfrastructure) developers working on a common foundational question in neuroscience. It is anticipated that these international networks will enable experimentation, analysis, and discovery in neuroscience at scales much larger than currently possible.

This interdisciplinary, international program is one element of NSF's broader effort directed at Understanding the Brain, a multi-year activity that includes NSF's participation in the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative (https://www.nsf.gov/brain/) and the phased approach to develop a research infrastructure for neuroscience as outlined in the Dear Colleague Letter NSF 16-047. The need for a program that helps neuroscientists collect, standardize, manage, and analyze the large amounts of data that result from research attempting to understand how the brain functions has been recognized by stakeholders in the scientific community and by the U.S. Congress in the American Innovation and Competitiveness Act (AICA) of 2017. The NSF and international partner agencies envision a connected portfolio of transformative, integrative projects that leverage existing global investments in neurotechnologies and create synergistic links across domestic and international investigators and communities, yielding novel ways of tackling the challenges of understanding the brain in action and in context.

**Awards:** 3 to 5 Standard Grants. Anticipated Funding: $10,000,000.
**Preliminary Proposal:** June 14, 2019
**Proposal Submission Deadline:** December 13, 2019
**Contacts:** Reed S. Beaman, telephone: (703) 292-7163, email: rsbeaman@nsf.gov

- Krastan B. Blagoev, telephone: (703) 292-4666, email: kblagoev@nsf.gov
- Shubhra Gangopadhyay, telephone: (703) 292-2485, email: sgangopa@nsf.gov
- Claire A. Hemingway, telephone: (703) 292-7135, email: chemingw@nsf.gov

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**Grant Program: Planning Grants for Engineering Research Centers (ERC)**
**Agency: National Science Foundation NSF 19-562**
**RFP Website**: https://www.nsf.gov/pubs/2019/nsf19562/nsf19562.htm
**Brief Description:** The ERC program is placing greater emphasis on research that leads to societal impact, including convergent approaches, engaging stakeholder communities, and strengthening team formation, in response to the NASEM study recommendations. The ERC program intends to support planning activities leading to convergent research team formation and capacity-building within the engineering community. This planning grant solicitation is designed to foster and facilitate the engineering community's thinking about how to form convergent research collaborations. To participate in a forthcoming ERC competition, one is not required to submit a planning grant proposal nor to receive a planning grant.
**Awards:** 30 to 40 Standard Grants. Anticipated Funding: $4,000,000. The planning grant is for one year and the proposed budget for each planning grant should not exceed $100,000.
**Letter of Intent:** Not required
**Proposal Submission Deadline:** June 3, 2019
**Contacts:** Junhong Chen, telephone: (703) 292-4623, email: junchen@nsf.gov

- Sandra Cruz-Pol, telephone: (703) 292-2928, email: scruzpol@nsf.gov
- Dana L. Denick, telephone: (703) 292-8866, email: ddenick@nsf.gov

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**Grant Program: Quantum Leap Challenge Institutes (QLCI)**
**Agency: National Science Foundation NSF 19-559**
**RFP Website**: https://www.nsf.gov/pubs/2019/nsf19559/nsf19559.htm

**Brief Description:** Quantum Leap Challenge Institutes are large-scale interdisciplinary research projects that aim to advance the frontiers of quantum information science and engineering. Research at these Institutes will span the focus areas of quantum computation, quantum communication, quantum simulation and/or quantum sensing. The institutes are expected to foster multidisciplinary approaches to specific scientific, technological, educational workforce development goals in these fields. Two types of awards will be supported under this program: (i) 12-month Conceptualization Grants (CGs) to support teams envisioning subsequent Institute proposals and (ii) 5-year Challenge Institute (CI) awards to establish and operate Quantum Leap Challenge Institutes. This activity is part of the Quantum Leap, one of the research Big Ideas promoted by the National Science Foundation (NSF). The NSF Quantum Leap Challenge Institutes program is consistent with the scope of *NSF multidisciplinary centers for quantum research and education* as described in the National Quantum Initiative Act [1].

In 2016, the NSF unveiled a set of "Big Ideas," ten bold, long-term research and process ideas that identify areas for future investment at the frontiers of science and engineering (see https://www.nsf.gov/news/special_reports/big_ideas/index.jsp). The Big Ideas represent unique opportunities to position our nation at the cutting edge of global science and engineering leadership by bringing together diverse disciplinary perspectives to support convergence research. Although proposals responding to this solicitation must be submitted to the Office of Multidisciplinary Activities (OMA) in the Directorate of Mathematical and Physical Sciences (MPS), they will subsequently be managed by a cross-disciplinary team of NSF Program Directors.

**Awards:** Standard Grants. Anticipated Funding: $94,000,000; **Estimated Number of Awards:** 1 to 28

**Letter of Intent:** Required

**Proposal Submission Deadline:**

**Proposal Due Dates:**

| | |
|---|---|
| **Round I (CG and CI proposals):** | |
| Letters of Intent for CG proposals due | Apr 1, 2019 |
| CG proposals due | June 3, 2019 |
| Letters of Intent for CI preliminary proposals (Round I) due | June 3, 2019 |
| CI preliminary proposals (Round I) due | Aug 1, 2019 |
| CI full proposals (by invitation only) due | Jan 2, 2020 |
| **Round II (CI proposals only):** | |
| Letters of Intent for CI preliminary proposals (Round II) due | Aug 3, 2020 |
| CI preliminary proposals (Round II) due | Sep 1, 2020 |
| CI full proposals (by invitation only) due | Feb 1, 2021 |

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) (NSF 19-1).

**Contacts:** Quantum Leap Challenge Institutes, telephone: (703) 292-4861, email: QLCI@nsf.gov

**National Institutes of Health**

**Grant Program: Blockchain Technology to Improve SUD Care (R43/R44 - Clinical Trial Optional)**
**Agency: National Institutes of Health RFA-DA-20-012**
**RFP Website**: https://grants.nih.gov/grants/guide/rfa-files/RFA-DA-20-012.html
**Brief Description:** Blockchain is a new way of storing data in a distributed ledger that allows various stakeholders to securely access the same information. Work describing a cryptographically secure chain of blocks started in the early 1990s and in 2008 the first blockchain was conceptualized and implemented the following year in the form of a cryptocurrency. Since then, uses of blockchain in industries outside of finance have emerged, including using blockchain technology to address the complex inefficiencies within health care ecosystem. This includes stakeholders ranging from insurance companies, to drug manufacturers, distributers, to clinical research organizations. Several programs have transitioned from ideation to implementation, in one case, even on a national level. In 2012, Estonia became the first country to nationalize blockchain within a healthcare system. Today, over 95% of the data generated by the county's hospital and doctors is digitized, and blockchain technology is used for assuring the integrity of stored electronic medical records as well as systems access logs.

Within the US, several government agencies have recognized the potential use of blockchain in the healthcare ecosystem. Projects have ranged from ideation to implementation. In 2016, the Office on the National Coordinator for Health Information Technology (ONC) and the National Institute of Standards and Technology (NIST), announced the Challenge, "Use of Blockchain in Health IT and Health-Related Research". The Challenge solicited white papers on the topic Blockchain technology and the potential use in health IT to address privacy, security, and scalability challenges of managing electronic health records and resources. More recently, on December 10th, 2018, under the HHS Reimagine initiative, the Department of Health and Human Services received Authority to Operate a blockchain-powered acquisition system. This initiative was the first in the US federal government and the first for public procurement in the world to utilize blockchain technology.
**Award:** According to statutory guidelines, total funding support (direct costs, indirect costs, fee) normally may not exceed $150,000 for Phase I awards and $1,000,000 for Phase II awards. However, NIH has received a waiver from SBA, as authorized by statute, to exceed the hard cap of $225,000 for Phase I or $1,500,000 for Phase II for specific topics.
**Letter of Intent:** 30 days prior to the application due date
By the date listed in Part 1. Overview Information, prospective applicants are asked to submit a letter of intent that includes the following information:

- Descriptive title of proposed activity
- Name(s), address(es), and telephone number(s) of the PD(s)/PI(s)
- Names of other key personnel
- Participating institution(s)
- Number and title of this funding opportunity

The letter of intent should be sent to: NIDALetterofIntent@mail.nih.gov
**Deadline:** July 31, 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: Senator Paul D. Wellstone Muscular Dystrophy Specialized Research Centers (MDSRC) (P50 Clinical Trial Optional)**
**Agency: National Institutes of Health RFA-NS-19-031**
**RFP Website**: https://grants.nih.gov/grants/guide/rfa-files/RFA-NS-19-031.html

**Brief Description:** NIAMS, NICHD, NHLBI and NINDS seek to continue this MDSRC program to advance research in the muscular dystrophies leading to improved understanding of these diseases and develop effective treatments and other strategies for reducing disease consequences. Under this FOA, each Center application must propose a clinical research project and at least one other project, which could include basic, preclinical translational or clinical research. The research projects should be related to a common theme, synergistic and should leverage the multidisciplinary and collaborative environment of this Center mechanism. Awards are expected to contribute to the long-term goals of advancing understanding of the causes and natural history of the dystrophies, developing therapies and reducing the impact of one or more form(s) of muscular dystrophy, as well as the training, research resource sharing and patient/community outreach goals described below. Projects should be focused only on muscular dystrophy research and may include studies of the impact of these diseases on skeletal muscle, the heart, respiratory system, sleep, smooth muscle, the central nervous system, gut or other organ systems as well as neuropsychological or neurobehavioral studies.
**Award:** Applicants may request up to $1,000,000 direct costs/year (exclusive of facilities and administrative costs of subcontractors with collaborating organizations).
**Letter of Intent:** 30 days prior to the application due date
**Deadline:** October 31, 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: PHS 2019-02 Omnibus Solicitation of the NIH, CDC, and FDA for Small Business Innovation Research Grant Applications (Parent SBIR [R43/R44] Clinical Trial Not Allowed)**
**Agency: National Institutes of Health PA-19-272**
PA-19-270 STTR R41/R42- Phase I, Phase II, and Fast Track
PA-19-271 STTR R41/R42- Phase I, Phase II, and Fast Track
PA-19-273 SBIR R43/R44- Phase I, Phase II, and Fast Track
**RFP Website**: https://grants.nih.gov/grants/guide/pa-files/PA-19-272.html
**Brief Description:** The SBIR program is structured in three phases, the first two of which are supported using SBIR funds. The objective of Phase I is to establish the technical/scientific merit and feasibility of the proposed R/R&D efforts. The objective of Phase II is to continue the research or R&D efforts initiated in Phase I. An objective of the SBIR program is to increase private sector commercialization of innovations derived from Federal R/R&D. The objective of Phase III, where appropriate, is for the SBC to pursue with non-SBIR funds (either Federal or non-Federal) the commercialization objectives resulting from the results of the R/R&D funded in Phases I and II. In some Federal agencies, Phase III may involve follow-on, non-SBIR funded R&D, or production contracts for products or processes intended for use by the U.S. Government.
The competition for SBIR Phase I and Phase II awards satisfies the competition requirement of the Armed Services Procurement Act, the Federal Property and Administrative Services Act, and the Competition in Contracting Act. Therefore, an agency that wishes to fund an SBIR Phase III project is not required to conduct another competition in order to satisfy those statutory provisions. As a result, in conducting actions relative to a Phase III SBIR award, it is sufficient to state for purposes of a Justification and Approval pursuant to FAR 6.302-5 that the project is a SBIR Phase III award that is derived from, extends, or logically concludes efforts performed under prior SBIR funding agreements and is authorized under 10 U.S.C. 2304(b)(2) or 41 U.S.C. 253(b)(2).
**Award:** Total funding support (direct costs, indirect costs, fee) normally may not exceed $252,131 for Phase I awards and $1,680,879 for Phase II awards. NIH has received a waiver from SBA, as authorized by statute, to exceed these total award amount hard caps for specific topics. The current list of approved

topics can be found at https://sbir.nih.gov/funding#omni-sbir. Navigate to the "Program Descriptions and Research Topics" document, Appendix A or the "2019 SBA approved topics list for budget waivers".
**Letter of Intent:** Not Required
**Deadline:** Standard dates apply, 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: Imaging, Biomarkers and Digital Pathomics for the Early Detection of Premetastatic Aggressive Cancer (R01 Clinical Trial Optional)**
**Agency: National Institutes of Health PAR-19-264**
**RFP Website**: https://grants.nih.gov/grants/guide/pa-files/PAR-19-264.html
**Brief Description:** The goal of this FOA is to develop improved methods for the early detection of aggressive cancer by managing overdiagnosis, reducing false positives and identifying lethal cancers from non-lethal disease using strategies aimed at effective integration and validation of imaging, biomarkers, pathomics and other -omic data. It is acknowledged that a biomarker is conceptually defined as a characteristic that is objectively measured and evaluated as an indicator of normal biologic processes, pathogenic processes or a biological response that could be used for early cancer detection. While imaging and biomarkers can both be derived from tissue, cancer cells, serum, plasma, urine or other bodily fluids, for the purpose of this FOA, a biomarker will specifically refer to results obtained from the analysis of biofluids and tissues that are not spatially or temporally resolved.

Likewise, imaging is referred to as a "tool" used to graphically depict spatially, functionally or temporally resolved cancer cells, tissues and their surroundings. In the context of this FOA, imaging can employ any of a variety of radiographic, sonographic, and other diagnostic technologies. Imaging and biomarker tests used in this fashion are generally obtained separately and then integrated as a function of time. An imageable biomarker, for the purpose of this FOA, combines structural, functional and/or temporal information from one or more dynamic biomarker(s) or image features that can be mapped and visualized.

Generally, imageable biomarker results are obtained simultaneously (rather than serially) and are comprised of data originating from a complex combination of cancer cells, cellular features, molecular analytes, or image derived features (genomic, proteomics, metabolomics, or other -omics data including radiomic and pathomic features) that may or may not be directly mapped for quantitative visualization, but are nonetheless associated with and derived from image-based acquisitions. Data obtained in this manner correlate to disease processes and aberrant metabolic pathways that can be applied clinically in the context of precision medicine.
**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:** July 10, 2019; December 10, 2019; July 10, 2020; December 10, 2020; July 9, 2021; December 10, 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: Focused Technology Research and Development (R01 - Clinical Trial Not Allowed)**
**Agency: National Institutes of Health PAR-19-253**
**Companion Funding Opportunity:** PAR-19-254, R21 Exploratory/Developmental Grant
**RFP Website**: https://grants.nih.gov/grants/guide/pa-files/PAR-19-253.html

**Brief Description: Support for Early-Stage Technology Development is Critical to Advance Biomedical Research:** Biomedical research is enabled and accelerated by the development of advanced technologies. Technology enables science by providing new ways to answer questions, and more importantly, allowing new types of questions to be asked that could not be anticipated in the absence of the enabling technology. New knowledge drives the imperative for new tools, and those tools open new questions, in a mutually reinforcing positive feedback loop that drives science forward.

A study by NIGMS staff in 2015, which included substantial, detailed input from the biomedical research community in response to a Request for Information (NOT-GM-15-118), concluded that there is a significant unmet need for explicit support of early stage technology development, before nascent tools are ready to be applied to untested biomedical research problems. Early stage technology development can be described in two stages: (I) exploratory proof-of-concept research to determine the best approach(es) for a technology development project, and (II) the subsequent research and development that focuses exclusively on creating and validating a working prototype technology before application to untested biomedical problems is possible.

To address the immediate need for funding programs that support early stage technology development, NIGMS developed programs focusing on the two stages described above. This FOA invites projects in Stage II research and development of a working prototype. A companion FOA, PAR-19-254 "Exploratory Research for Technology Development" supports projects in Stage I evaluation of an untested concept.

**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 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 Research for Technology Development (R21 - Clinical Trial Not Allowed)**

**Agency: National Institutes of Health PAR-19-254**

**RFP Website**: https://grants.nih.gov/grants/guide/pa-files/PAR-19-254.html

**Brief Description: Support for Early-Stage Technology Development is Critical to Advance Biomedical Research:** Biomedical research is enabled and accelerated by the development of advanced technologies. Technology enables science by providing new ways to answer questions, and more importantly, allowing new types of questions to be asked that could not be anticipated in the absence of the enabling technology. New knowledge drives the imperative for new tools, and those tools open new questions, in a mutually reinforcing positive feedback loop that drives science forward.

A study by NIGMS staff in 2015, which included substantial, detailed input from the biomedical research community in response to a Request for Information (NOT-GM-15-118), concluded that there is a significant unmet need for explicit support of early stage technology development, before nascent tools are ready to be applied to untested biomedical research problems. Early stage technology development can be described in two stages: (I) exploratory proof-of-concept research to determine the best approach(es) for a technology development project, and (II) the subsequent research and development that focuses exclusively on creating and validating a working prototype technology before application to untested biomedical problems is possible.

To address the immediate need for funding programs that support early stage technology development, NIGMS developed programs focusing on the two stages described above. This FOA invites projects in Stage II research and development of a working prototype. A companion FOA, PAR-19-

254 "Exploratory Research for Technology Development" supports projects in Stage I evaluation of an untested concept.
**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 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: BRAIN Initiative: Tools to Facilitate High-Throughput Microconnectivity Analysis (R01 Clinical Trial Not Allowed)**
**Agency: National Institutes of Health RFA-MH-20-135**
**RFP Website**: https://grants.nih.gov/grants/guide/rfa-files/RFA-MH-20-135.html
**Brief Description:** This FOA is designed to support development and validation of novel tools to facilitate the detailed analysis of brain microconnectivity. The primary goal is to provide techniques and resources for understanding and delineating the structure of complex circuits at the level of synaptic connections, alone or in combination with methods for identifying important cellular and circuit features, for example, for classifying or characterizing cellular or synaptic phenotypes. Understanding and delineating complex circuits will provide insight into important cellular interactions that underlie brain function and ultimately complex behaviors. Defining cellular and circuit-level function is dependent on detailed knowledge about the components and structure of the circuit. Such knowledge, in turn, is fundamental to understanding how these features underlie cognition and behavior, which should aid in the development of targeted cell-type and circuit-specific therapeutics to treat brain disorders. This initiative is focused on developing and optimizing tools and resources to characterize the cells and connections within neuronal circuits.
Recent advances in electron microscopy (EM) and alternative techniques for nanoscale imaging have enabled major gains in the rate and quality of morphological and connectivity analysis of neurons and their embedded circuits. Some of these gains have come from ongoing EM efforts outside of NIH, including the HHMI Janelia Farm FlyEM project, the IARPA MICrONS project, and major efforts from the Max Planck Institute in Germany. In addition, newer techniques such as expansion microscopy and array tomography, and emerging methods for barcode-based tagging of synaptic connections, have advanced to the point they may be considered for the purposes of mapping brain connectivity with synapse resolution.
Despite these ongoing projects and the progress they have made, addressing the dramatic scale of mapping circuits at the level of the trillions of synapses in the brain, and the scope of the analytic challenges for interpreting their connectivity, requires concerted technical development towards true high-throughput microconnectomics. The goal of this proposed effort is to produce the necessary tools, including novel or refined techniques and new datasets, to bring microconnectivity analysis into routine use for interrogating healthy and diseased brains, in model organisms and humans. More broadly, the intention is to put within reach the ultimate challenge of understanding the circuit level substrates of brain activity.
Development of novel tools that will delineate anatomical connections between cells and expand our knowledge of circuit architecture and function is an area well poised for additional investment. Several efforts are currently underway to study large-scale, long-range connections, such as the NIH Human Connectome Project, as well as large scale rodent connectional studies. This FOA solicits applications to develop next-generation, innovative technologies for the analysis of the microconnectome. Traditional EM studies have provided our best understanding to date of synaptic connections but breakthroughs in additional imaging modalities hold promise for alternative approaches that can be implemented to deliver high quality connectional information at high throughput.

**Award:** Application budgets are not limited but need to reflect the actual needs of the proposed project.
**Letter of Intent:** Not required
**Deadline:** September 27, 2019 and September 30, 2020, by 5:00 PM local time of applicant organization. All types of non-AIDS applications allowed for this funding opportunity announcement are due on these dates. No late applications will be accepted for this Funding Opportunity Announcement.
Applicants are encouraged to apply early to allow adequate time to make any corrections to errors found in the application during the submission process by the due date.

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**Grant Program: NIH Director's Pioneer Award Program (DP1 Clinical Trial Optional)**
**Agency: National Institutes of Health RFA-RM-19-005**
**RFP Website**: https://grants.nih.gov/grants/guide/rfa-files/RFA-RM-19-005.html
**Brief Description:** The NIH Director's Pioneer Award supports individual scientists of exceptional creativity who propose highly innovative and broadly impactful research towards the ultimate goal of enhancing human health. In order to support the most innovative and impactful research, the NIH recognizes the need to promote a diverse research workforce. Applications to this award program should reflect the full diversity of potential applicants, applicant institutions, and research topic areas. Applications from talented researchers with diverse backgrounds underrepresented in research, including underrepresented racial and ethnic groups, persons with disabilities, and women are strongly encouraged to apply to this Funding Opportunity Announcement. Outstanding research is conducted at a broad spectrum of institutions. In seeking to support the highest quality research, this Funding Opportunity Announcement encourages applications from the full range of eligible institutions, including those that may serve primarily underrepresented groups, those that may be less research-intensive, and from all domestic geographic locations. Applications are welcome in all research topics that have the potential ultimately to have a substantial impact on human health. In addition to the nominal biomedical sciences, these include, but are not limited to, relevant research topics in the behavioral, social, applied, and formal sciences. The potential for impact on human health may be near term (clinical or translational research) or long term (basic research). The paramount features of the research proposed must be innovation and magnitude of potential impact.

In the Pioneer Award program, emphases are on the qualities of the investigator, the innovativeness, and potential impact of the proposed research. Preliminary data and detailed experimental plans are not requested. To be considered pioneering, the proposed research must reflect substantially different ideas from those being pursued in the investigator's current research program or elsewhere. The Pioneer Award is not intended to expand a current research program into the area of the proposed project. While the research direction may rely on the applicant's prior work and expertise as its foundation, it cannot be an obvious extension or scale-up of a current research enterprise which may be competitive as a new or renewal R01 application. Rather, the proposed project must reflect a fundamental new insight, and which may involve exceptionally innovative approaches and/or radically unconventional hypotheses. Applications for projects that are extensions of ongoing research should not be submitted.
**Award:** Awards will be for $700,000 in direct costs per year, plus applicable Facilities and Administrative (F&A) costs.
**Letter of Intent:** Not required
**Deadline:** September 9, 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 Director's Transformative Research Awards (R01 Clinical Trial Optional)**
**Agency: National Institutes of Health RFA-RM-19-007**
**RFP Website**: https://grants.nih.gov/grants/guide/rfa-files/RFA-RM-19-007.html
**Brief Description:** The NIH Director's Transformative Research Award Program supports collaborative investigative teams or individual scientists who propose unusually innovative research projects, which, if successful, would have a major impact in a broad area of relevance to the NIH. To be considered transformative, projects must have the potential to create or overturn fundamental scientific paradigms through novel approaches, transform the way research is conducted through the development of novel tools or technologies, or lead to major improvements in health through the development of highly innovative therapies, diagnostic tools, or preventive strategies. Consistent with this focus, Transformative Research Award applications should reflect ideas substantially different from mainstream concepts.

Several key features of this FOA are designed to emphasize to applicants and peer reviewers that Transformative Research applications are very different from conventional, investigator-initiated research applications.The Transformative Research application focuses on the importance of the problem, the novelty of the hypothesis and/or the proposed methodology, and the magnitude of the potential impact rather than on preliminary data or experimental details. Reviewers will be instructed to emphasize the significance and innovation of the application in their evaluations. Applicants and reviewers should keep the goal of the Transformative Research Award in mind throughout the process– to solicit and fund unusually innovative and potentially transformative research.

In order to support the most innovative and impactful research, the NIH recognizes the need to promote a diverse research workforce. Applications to this award program should reflect the full diversity of potential applicants, applicant institutions, and research topic areas. Applications from talented researchers with diverse backgrounds underrepresented in research, including underrepresented racial and ethnic groups, persons with disabilities, and women are strongly encouraged to apply to this Funding Opportunity Announcement. Outstanding research is conducted at a broad spectrum of institutions. In seeking to support the highest quality research, this Funding Opportunity Announcement encourages applications from the full range of eligible institutions, including those that may serve primarily underrepresented groups, those that may be less research-intensive, and from all domestic geographic locations. Applications are welcome in all research topics that have the potential ultimately to have a substantial impact on human health. In addition to the nominal biomedical sciences, these include, but are not limited to, relevant research topics in the behavioral, social, applied, and formal sciences. The potential for impact on human health may be near term (clinical or translational research) or long term (basic research). The paramount features of the research proposed must be innovation and magnitude of potential impact.
**Award:** Application budgets are not limited but need to reflect the actual needs of the proposed project.
**Letter of Intent:** Not required
**Deadline:** September 20, 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: Institutional Translational Research Training Program (T32)**
**Agency: National Institutes of Health PAR-19-228**
**RFP Website**: https://grants.nih.gov/grants/guide/pa-files/PAR-19-228.html
**Brief Description:** The purpose of the Institutional Translational Research Training Program is to equip trainees with the knowledge and skills needed to advance basic research toward clinical application. These programs will support, students and/or postdocs conducting basic, disease-relevant research in an environment that includes 1) basic scientists and clinicians who are actively engaged in collaborative

research projects, 2) neuroscience researchers with expertise in translational processes who are conducting research designed to move basic discoveries toward clinical application and 3) relationships with industry and government regulatory agencies. Programs will have a cohesive educational approach to translational training in areas relevant to the NINDS and NIA missions, and in which students and postdocs learn the processes involved in translational research in the context of their individual projects. Programs supported by this FOA must include activities that ensure a thorough understanding of experimental design, strong statistical and analytical skills, and skills for communicating science with a wide variety of audiences. These programs are intended to be 2 years in duration and support training of one or more of the following groups: advanced predoctoral students, postdoctoral fellows and fellowship-stage clinicians. Upon completion of the program, trainees will be prepared to address basic research problems with an understanding of the requirements for translating discoveries into viable therapies.

This Funding Opportunity Announcement (FOA) does not allow appointed Trainees to lead an independent clinical trial but does allow them to obtain research experience in a clinical trial led by a mentor or co-mentor.

**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:** May 29, 2019; May 27, 2020; May 26, 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: Undergraduate Research Training Initiative for Student Enhancement (U-RISE) (T34)**
**Agency: National Institutes of Health PAR-19-218**
**RFP Website**: https://grants.nih.gov/grants/guide/pa-files/PAR-19-218.html
**Brief Description:** The **Overarching Objective** of this Undergraduate Research Training Initiative for Student Enhancement program is to develop a diverse pool of undergraduates who complete their baccalaureate degree and transition into and complete biomedical, research-focused higher degree programs (e.g., Ph.D. or M.D./Ph.D.). The long-term goal is to develop a diverse pool of well-trained 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 U-RISE program will support trainees who are earning a baccalaureate degree at research-active institutions and who intend to complete a biomedical research higher degree program (e.g., Ph.D., or M.D./Ph.D.).
**Award:** Application budgets are not limited but need to reflect the actual needs of the proposed project.
**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: NINDS Institutional Research Training Program (T32)**
**Agency: National Institutes of Health PAR-19-211**
**RFP Website**: https://grants.nih.gov/grants/guide/pa-files/PAR-19-211.html
**Brief Description:** The objective of the NINDS Institutional Research Training Program is to support outstanding training with the breadth and depth to prepare advanced predoctoral and postdoctoral trainees to become successful scientists in a rapidly evolving research enterprise that is increasingly complex and multidisciplinary. Neuroscience research requires investigators who can draw on knowledge and approaches from multiple disciplines and levels of analysis, and apply this broad knowledge in novel ways to yield new discoveries about the nervous system. Moreover, impactful neuroscience research requires investigators with strong foundational skills in experimental design, statistical methodology and quantitative reasoning.
**Summary of key points.** It is expected that the programs supported under this funding opportunity announcement will provide:

- training and activities with a defined goal and within a thematic area that will add depth and breadth to the trainees' scientific development
- an emphasis on sound experimental design, the proper use of statistical methodology and a theoretical understanding by each trainee of the quantitative limits and capabilities of his or her experimental system (quantitative literacy)
- effective oversight of trainee mentoring and progression to the next career stage
- an environment that promotes the success of individuals with a wide variety of backgrounds and perspectives
- direct access to an appropriate diversity of role models, both within the institution and through activities such as invited seminars.
- activities for trainees to develop oral and written skills for communicating their science to a wide variety of audiences
- access to structured career development advising and opportunities to learn about career options in various sectors

Moreover, NINDS T32 support should only be provided to trainees in labs of mentors who proactively ensure the opportunity to lead and be first author on a significant project.
The proposed institutional research training program may complement other ongoing research training and career development programs at the applicant institution, but the proposed program must be clearly distinct from related programs currently receiving Federal support.
**Award:** Application budgets are not limited, but need to reflect the actual needs of the proposed project up to 5 years.

**Letter of Intent:** 30 days prior to the application due date
**Deadline:** May 29, 2019; May 27, 2020; May 26, 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: Team-Based Design in Biomedical Engineering Education (R25 Clinical Trial Not Allowed)**
**Agency: National Institutes of Health PAR-19-215**
**RFP Website**: https://grants.nih.gov/grants/guide/pa-files/PAR-19-215.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 NIBIB R25 program is to support educational activities that complement and/or enhance the training of a workforce to meet the nation's biomedical, behavioral and clinical research needs. To accomplish the stated over-arching goal, this FOA will support creative educational activities with a primary focus on:

- ***Courses for Skills Development:*** For example, courses and programs that, using a team-based design approach, incorporate state-of-the-art best practices (such as multidisciplinary/interdisciplinary education, the regulatory pathway and other issues related to the commercialization of medical devices, and the immersion of engineering students in a clinical environment) and further enhance these with novel creative and/or ground-breaking approaches and activities which will be implemented and evaluated with the goal of disseminating the outcomes for the benefit of the larger biomedical engineering education community.

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:** Direct costs of up to $20,000 per year may be requested. Programs that include a clinical immersion program outside the academic year and lasting 6 to 10 weeks may request an additional $20,000 to cover participant costs (see Participant Costs section below), yielding a total of $40,000 in direct costs.
**Letter of Intent:** April 29, 2019, April 27, 2020, April 26,2021
**Deadline:** May 31, 2019; May 28, 2020; May 28, 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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**Department of Transportation**

**Grant Program: FY 2019 National Infrastructure Investments**
**Agency: Department of Transportation DTOS59-19-RA-BUILD**
**Website**: https://www.transportation.gov/buildgrants/build-nofo
**Brief Description:** The Consolidated Appropriations Act, 2019 (Pub. L. 116-6, February 15, 2019) ("FY 2019 Appropriations Act") appropriated $900 million to be awarded by the Department of Transportation ("DOT") for National Infrastructure Investments. This appropriation stems from the program funded and implemented pursuant to the American Recovery and Reinvestment Act of 2009 (the "Recovery Act") and is known as the Better Utilizing Investments to Leverage Development, or "BUILD Transportation grants," program. Funds for the FY 2019 BUILD Transportation grants program are to be awarded on a competitive basis for surface transportation infrastructure projects that will have a significant local or regional impact. The purpose of this notice is to solicit applications for BUILD Transportation grants.

The FY 2019 BUILD Transportation grant program will make awards to surface transportation infrastructure projects that will have a significant impact throughout the country. Each section of this notice contains information and instructions relevant to the application process for these BUILD Transportation grants, and all applicants should read this notice in its entirety so that they have the information they need to submit eligible and competitive applications. For this round of BUILD Transportation grants, the maximum grant award is $25 million, and no more than $90 million can be awarded to a single State, as specified in the FY 2019 Appropriations Act. Per statute, the FY 2019 selection criteria are the same as under the FY 2017 TIGER program, although the description for each criterion has been updated. For FY 2019 BUILD Transportation grants, the definitions of urban and rural areas differ from previous rounds. Additionally, not more than 50 percent of funds will be awarded to projects located in urban and rural areas, respectively.
**Awards:** The FY 2019 Appropriations Act specifies that BUILD Transportation grants may not be less than $5 million and not greater than $25 million, except that for projects located in rural areas (as defined in Section C.3.ii.) the award size is $1 million. There is no minimum award size, regardless of location, for BUILD Transportation planning grants.
**Proposal Deadline:** July 15, 2019
**Contact Information:** Program staff will address questions to BUILDgrants@dot.gov throughout the application period.

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**Grant Program: Pipeline Safety Research Competitive Academic Agreement Program (CAAP)**
**Agency: Department of Transportation 693JK319NF0005**
**Website**: https://www.fedconnect.net/FedConnect/default.htm
**Brief Description:** The U.S. Department of Transportation (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) hereby requests applications from non-profit institutions of higher education for CAAP funding to research innovative solutions to pipeline corrosion and other known pipeline integrity challenges.

Research Area #1: Anomaly Detection and Characterization Background: Advancements in nondestructive inspection methods have continued to increase in sophistication and capabilities, allowing for the detection of more pipeline anomalies with an array of geometries, depths, severities, and types. However, current technologies are limited in identifying interactive anomalies.

Research Area #2: Develop and Validate ILI Technologies for Circumferential Anomalies and Bending Stresses Collectively, PHMSA and industry have invested heavily in improvements to In Line Inspection (ILI) technology towards a variety of integrity threats. However, some preliminary research was funded on circumferential cracking detection and characterization cracking in dents (particularly on the pipe's bottom side) creating a driver for additional research and development. This project should

develop and validate advanced ILI technology in compliance with B31G and Remaining Strength of Corroded Pipe (RSTRENG) to detect circumferential cracking and characterize its severity in dents (particularly bottom side). The project should also quantify bending stresses, including those contributions from geotechnical and environmental conditions.

Research Area #3: Unmanned Aerial Systems (UAS) to Enhance Pipeline Safety Background: Unmanned Aerial Systems (UAS), using both line of sight and beyond line of sight unmanned aerial vehicles, potentially provide the safety regulator the ability to gain visual access to areas that would otherwise be inaccessible due to rough terrain, inclement weather, or other adverse conditions. Furthermore, UAS-collected information may provide pipeline inspectors the ability to determine regulatory compliance, and enhance incident response following pipeline leaks or natural disasters.

**Awards:** Subject to the availability of funds, PHMSA anticipates awarding up to $2,000,000 and the amount of Federal funding may not exceed $250,000 per award.

**Proposal Deadline:** May 03, 2019

**Contact Information:** Agreement Administrator Ben Patterson Ben.Patterson@dot.gov

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**Grant Program: FY19 High Priority Program – Innovative Technology Deployment (HP-ITD)**
**Agency: Department of Transportation DOT/Federal Motor Carrier Safety Administration FM-MHP-19-002**

**Website**: https://www.grantsolutions.gov/gs/preaward/previewPublicAnnouncement.do?id=63372

**Brief Description:** As the lead government agency responsible for the regulation and safety oversight of commercial motor vehicles (CMV), FMCSA awards HP-ITD funds to support innovative and impactful projects that advance its mission to reduce crashes, injuries, and fatalities involving large trucks and buses. Funding is available for the support of innovative projects that improve safety and compliance with CMV regulations, are national in scope, demonstrate new technologies, and reduce the number of CMV crashes.These activities are supported in alignment with the U.S. Department of Transportations strategic goals of: •SAFETY:Reduce transportation-related fatalities and serious injuries across the transportation system.•INFRASTRUCTURE:Invest in infrastructure to ensure safety, mobility and accessibility and to stimulate economic growth, productivity and competitiveness for American workers and businesses.•INNOVATION:Lead in the development and deployment of innovative practices and technologies that improve the safety and performance of the Nations transportation system.•ACCOUNTABILITY:Serve the Nation with reduced regulatory burden and greater efficiency, effectiveness and accountability.

**Awards:** Any award for funds to develop or revise an ITD PP/TLD shall not exceed $150,000 of Federal funding.

**Proposal Deadline:** April 26, 2019

**Contact Information:** Administrative and Budgetary Requirements: 202-366-4186 Rikita Jarrett (Grants Management Office) email: rikita.jarrett@dot.gov
Program Requirements or Technical Assistance: Bettina Conroy 518-810-2985 email: bettina.conroy@dot.gov

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**Grant Program: Dwight David Eisenhower Transportation Fellowship Program (DDETFP) Graduate Fellowship**
**Agency: Department of Transportation 693JJ318NF5227-2019**

**Website**: https://fhwaapps.fhwa.dot.gov/tficsp/signin.aspx.

**Brief Description:** The DDETFP Graduate Fellowship provides funding for students to pursue master's or doctoral degrees in transportation-related disciplines. The program objectives are: 1) to attract the Nation's brightest minds to the field of transportation; 2) to enhance the careers of transportation

professionals by encouraging them to seek advanced degrees; and 3) to retain top talent in the transportation industry of the United States. The DDETFP is intended to enhance the breadth and scope of knowledge of the entire transportation community in the United States. The DDETFP Graduate Fellowship encompasses all modes of transportation.
**Awards:** Actual stipend level may vary based upon IHE formal policy and available funding.
**Proposal Deadline:** April 8, 2019
**Contact Information:** Contact the FHWA Universities and Grants Programs (U&GP) at 703-235-0538 or transportationedu@dot.gov.

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

**Grant Program: Robust and Efficient Computing Architectures, Algorithms and Applications for Embedded Deep Learning**
**Agency: Department of Defense Department of the Air Force FA875019S7007**
**Website**:
https://www.fbo.gov/index.php?s=opportunity&mode=form&id=c7fb258377187a7bb851bcb73a2c747a&tab=core&_cview=0
**Brief Description:** AFRL's intent is to develop and demonstrate innovative modular computing system architectures and applications to meet the Air Force's need for future real-time embedded plug-and-play capabilities. Technologies and applications may include, but are not limited to, artificial intelligence and machine learning models and algorithms for big data analytics for multi-source and multi-modal sensor data, data fusion algorithms for situation understanding and sense-making, and autonomous decision making techniques. Modular designs should support interchangeable sensors and other devices, with automatic software reconfiguration based on the available resources. Data bandwidth requirements of future systems can be expected to significantly increase. Compute and interface methods should be selected that will be scalable accordingly. Optimizations for size weight and power (SWaP) will be a priority.

AFRL also requires technologies and methods that validate, verify, and improve the scalability, robustness and security of AI/ML technology, particularly deep learning models and algorithms. The research topics may include developing methods for power-aware and energy -optimized deep learning models and algorithms when deployed in embedded computing environments with dynamic data. The research topics may also include exploitation approaches and robustness enhancement techniques for deep learning systems. Areas related to developing robust and secure ML systems should be addressed such as exploring and quantifying design optimization, and performance-robustness tradeoff analysis methods. The need exists to investigate methods for quantifying the impact of various acceleration and efficient learning techniques on the robustness of deep learning systems. The vulnerability impact of deep learning systems implemented on different hardware platforms should be considered.
**Awards:** Individual awards will not normally exceed 36 months with dollar values normally ranging from $1M to $3M. There is also the potential to make awards up to any dollar value as long as the value does not exceed the available BAA ceiling amount.
**Proposal Deadline:** White Papers: FY20 by 31 July 2019
FY21 by 29 May 2020
FY22 by 28 May 2021
FY23 by 27 May 2022
**Contact Information:** Albert Frantz, AFRL/RITB Telephone: (315) 330-4713
Email: albert.frantz@us.af.mil

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**Grant Program: MINERVA Research Initiative**
**Agency: Department of Defense WHS-AD-FOA-19**
**Website**: https://minerva.defense.gov/Research/Research-Priorities/
**Brief Description:** The Minerva Research Initiative (Minerva) emphasizes questions of strategic importance to U.S. national security policy. It seeks to increase the Department's intellectual capital in the social sciences and improve its ability to address future challenges and build bridges between the Department and the social science community. Minerva brings together universities and other research institutions around the world and supports multidisciplinary and cross-institutional projects addressing specific interest areas determined by the Department of Defense. The Minerva program aims to promote research in specific areas of social science and to promote a candid and constructive relationship between DoD and the social science academic community.

The Minerva Research Initiative competition is for research related to nine (9) topics listed below. Innovative white papers and proposals related to these research areas are highly encouraged. Detailed descriptions of the interest areas—which are intended to provide a frame of reference and are not meant to be restrictive—can be found in Section IX, "Minerva Topics."

Topic 1: Peer/Near-peer Statecraft, Influence, and Regional Balance of Power
Topic 2: Power, Deterrence, and Escalation Management
Topic 3: Alliances and Burden Sharing
Topic 4: Economic Interdependence and Security
Topic 5: Economic Viability, Resilience, and Sustainability of Logistics Infrastructure
Topic 6: Multi-Domain Behavioral Complexity and Computational Social Modeling
Topic 7: Autonomy, Artificial Intelligence, Machine Ethics, and Social Interactions
Topic 8: Models and Methods for Understanding Covert Online Influence
Topic 9: Automated Cyber Vulnerability Analysis

**Awards:** Various; Available Funding: $15,000,000
**Proposal Deadline:** White Papers: Thursday, June 20, 2019 3:00 PM EDT Full Proposals: Thursday, September 26, 2019 3:00 PM EDT
**Contact Information:** Dr. David Montgomery Basic Research Office, OUSD (Research & Engineering) and OUSD (Policy) Email address: david.w.montgomery61.civ@mail.mil

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**Grant Program: Defense Established Program to Stimulate Competitive Research (DEPSCoR)**
**Agency: Department of Defense Air Force Office of Scientific Research FOA-AFRL-AFOSR-2019-0004**
**Website**: https://afrl.dodlive.mil/funding/
**Brief Description:** The Department of Defense (DOD) plans to award fiscal year 2019 (FY19) appropriations for a future funding opportunity announcement for the Defense Established Program to Stimulate Competitive Research (DEPSCoR) program. Approximately $3.6 million in total funding will be made available for this program to fund approximately six (6) awards up to $600,000 (total cost) each. Each award will be funded up to $200,000 (total cost) per year for three (3) years in the form of a grant. Subjected to funding availability. The program objectives for DEPSCoR are described in the program statue (Pub. L. 115–91, div. A, title II, §219[e][3], Dec. 12, 2017, 131 Stat. 1331).
The website https://discover.dtic.mil/products-services/ is a non-comprehensive repository of government-funded scientific, technical, and engineering information for the Department. Researchers new to DoD (Applicant) are encouraged to visit the site as a starting point for identifying past and present DoD-funded researchers.
**Awards:** Up to $600,000 for three years

**Proposal Deadline:** White Papers: 4:00 PM Eastern Time on: 11 June 2019 Proposals: 4:00 PM Eastern Time on: 16 August 2019
**Contact Information:** Dr. T.R. Govindan Army Research Office Email Address: t.r.govindan.civ@mail.mil

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**Grant Program: ARMY Applications Lab Broad Agency Announcement for Disruptive Applications**
**Agency: Department of Defense Dept. of the Army – W911NF-19-S-0004**
**Website**:
https://www.fbo.gov/index?s=opportunity&mode=form&tab=core&id=f0745d1d919f7406b14a68c780057e1f
**Brief Description:** Proposals and whitepapers are expected to be for cutting-edge innovations that could produce discoveries with the potential for significant impacts to enable new and improved Army operational capabilities. The specific research areas and topics of interest described in this document should be viewed as suggestive, rather than limiting. AAL is always interested in considering new innovative research concepts of relevance to the Army. Additional information about AAL areas of interest can be found on the AAL website: http://www.aal.mil. Areas of interest include but are not limited to the following:
a. Autonomous platforms – The Army is particularly interested in research in autonomous ground and air vehicles, which must operate in open, urban and cluttered environments. Robotics and autonomous systems regardless of their missions require similar concepts and technologies.
b. Artificial Intelligence and Machine Learning (AI/ML) - The Army is interested in AI/ML research in areas which can reduce the cognitive burden on humans and improve overall performance through human-machine teaming.
c. Data visualization and synthetic environments – The Army is interested in research involving concepts that enable improved situational awareness and the visualization and navigation of large data sets and to enhance operational activities and training and readiness.
d. Assured Position, Navigation, and Timing (PNT) – The Army is interested in research involving novel new PNT technologies which could be key enablers for many capabilities including autonomous vehicles, communications, and land navigation.
e. Power generation and management technologies – The Army frequently must operate where power infrastructure is not available, on small vehicles or for individual Soldiers.
f. Sensing – The Army is interested in developing a detailed understanding of the environments and activities in the areas where it operates.
g. Communications & networks – It is critical the Army maintain secure, reliable communications for Soldiers, vehicles and at fixed locations even in austere environments.
h. Computation – The Army has a growing need for high performance computational capabilities to exploit large data sets and to compute complex AI/ML algorithms for many applications.
i. Space – Like many commercial interests, the Army is interested in exploiting space assets to solve a range of problems.
j. Internet of Things (IoT) – The Army needs to better integrate a wide range of capabilities and equipment and capitalize on commercial developments in the industrial and human IOT.
k. Quantum Technologies – The Army seeks to better employ quantum sciences in a number of areas to improve the performance and security of its future systems.
**Awards:** Various
**Proposal Deadline:** White Papers: 4:00 PM Eastern Time on: 11 June 2019 Proposals: 4:00 PM Eastern Time on: 16 August 2019

**Contact Information:** Dr. T.R. Govindan Army Research Office Email Address: t.r.govindan.civ@mail.mil

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**Grant Program: TrojAI**
**Agency: Department of Defense Dept. of the Army – W911NF-19-S-0012**
**Website**: https://www.arl.army.mil/www/default.cfm?page=8
**Brief Description:** The U.S. Army Research Office (ARO) in partnership with the Intelligence Advanced Research Projects Activity (IARPA) seeks research and development of technology and techniques for detection of Trojans in Artificial Intelligence. TrojAI is envisioned to be a 2-year effort with multiple awardees coming together as a group of performers (hereinafter referred to as the "performer team"), which will work together to achieve the common program goals set forth in this BAA.

Using current machine learning methods, an artificial intelligence (AI) is trained on data, learns relationships in that data, and then is deployed to the world to operate on new data. For example, an AI can be trained on images of traffic signs, learn what stop signs and speed limit signs look like, and then be deployed as part of an autonomous car. The problem is that an adversary that can disrupt the training pipeline can insert Trojan behaviors into the AI. For example, an AI learning to distinguish traffic signs can be given potentially just a few additional examples of stop signs with yellow squares on them, each labeled "speed limit sign". If the AI were deployed in a self-driving car, an adversary could cause the car to run through the stop sign just by putting a sticky note on it, since the AI would incorrectly see it as a speed limit sign. The goal of the TrojAI Program is to combat such Trojan attacks by inspecting AIs for Trojans.

The performer team will develop and deliver software to automatically inspect an AI and predict if it has a Trojan. The AIs will be neural networks trained in a classification task. Initially, the AIs will classify small images, but later stages of the program may expand to AIs that classify audio or text or perform other tasks. The AIs will classify input data into a small number of classes at near-human or super-human performance. As a reference, the image classification tasks will be analogous to the German Traffic Sign Recognition, but performers should not assume that the input data or classes correspond to any public data sets. Trojan attacks will modify a portion of the AIs to recognize input triggers and cause misclassification, similar to the "speed limit sign" example above. The performer team will deliver software that detects which AIs have been subject to a Trojan attack. Performer software will take as input the AI's source code, architecture and compiled binary. The performer software may also receive a small number of examples of valid data from the AI's problem domain. The performer team should be prepared to initially develop methods for AIs made of feedforward networks (e.g. Convolutional Neural Nets like ResNet for image classification) and then later develop methods for AIs made of recurrent networks (e.g. Long-Short Term Memory Networks for audio or text classification).
**Awards:** Various
**Proposal Deadline:** Concept Papers Due: May 31, 2019 Final Proposals by Invite Only Due: July 25, 2019
**Contact Information:** Kevin J Bassler Grants/ Contracts Officer
kevin.j.bassler.civ@mail.mil

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**Grant Program: Trapped Ion Quantum Computing Systems**
**Agency: Department of Defense Dept. of the Army – W911NF-19-S-0011**
**Website**: https://www.grants.gov/web/grants/search-grants.html
**Brief Description:** The U.S. Army Research Office (ARO) in partnership with the National Security Agency (NSA) is soliciting proposals for research in Trapped Ion Qubits. This BAA has three research goals; (a) substantially reduce noise levels detrimental to high fidelity gates in trapped ion systems and to

improve the stability of these gates once achieved; (b) explore novel quantum information encoding schemes and/or entanglement generation schemes with trapped ion systems; (c) development of critical supporting technology required for successful highly stable high fidelity trapped ion systems. Proposals are sought that address one of the three BAA goals: 1. Highly stable high fidelity trapped ion systems 2. Novel encoding and entanglement generation schemes 3. Key supporting technology to enable highly stable high fidelity trapped ion systems.
**Awards:** Various
**Proposal Deadline:** White Papers: 4:00 PM Eastern Time on: 11 June 2019 Proposals: 4:00 PM Eastern Time on: 16 August 2019
**Contact Information:** Dr. T.R. Govindan Army Research Office Email Address: t.r.govindan.civ@mail.mil

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**Grant Program: Development of Quantum Algorithms**
**Agency: Department of Defense Dept. of the Army – W911NF-19-S-0010**
**Website**:
https://www.fbo.gov/index?s=opportunity&mode=form&id=4f726de802607c4d1764649b71fa8521&tab=core&_cview=0
**Brief Description:** The U.S. Army Research Office (ARO) together with the National Security Agency (NSA) is soliciting proposals to develop new quantum computing algorithms for hard computational problems, develop insights into the power of quantum computation, and consider issues of quantum complexity and computability. Proposals for research in quantum algorithms should primarily be to devise novel quantum algorithms for solving mathematically and computationally hard problems from such diverse fields as algebra, number theory, geometry, analysis, optimization, graph theory, differential equations, combinatorics, topology, logic, and simulation. Quantum algorithms that are developed should focus on constructive solutions for specific tasks and on general methodologies for expressing and analyzing algorithms tailored to specific problems. Complexity analysis such as upper and lower bounds on algorithms, including developing new methodologies for deriving such bounds, is encouraged. Noisy intermediate scale quantum (NISQ) computation produces approximate solutions. The error in these solutions depends upon the noise. Complexity analysis of quantum algorithms for such approximate solutions produced by NISQ machines is of interest.
**Awards:** Various
**Proposal Deadline:** White Papers: 4:00 PM Eastern Time on: 5 June 2019 Proposals: 4:00 PM Eastern Time on: 1 August 2019
**Contact Information:** Dr. T.R. Govindan Army Research Office Email Address: t.r.govindan.civ@mail.mil

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**Grant Program: Biological Technologies**
**Agency: Department of Defense DARPA HR001119S0048**
**Website**:
https://www.fbo.gov/index?s=opportunity&mode=form&id=107ff792d860276890c1d3dcd364c661&tab=core&_cview=1
**Brief Description:** The mission of BTO is to foster, demonstrate, and transition breakthrough fundamental research, discoveries, and applications that integrate biology, engineering, computer science, mathematics, and the physical sciences. BTO's investment portfolio goes far beyond life sciences applications in medicine to include areas of research such as human-machine interfaces, microbes as production platforms, and deep exploration of the impact of evolving ecologies and environments on U.S. readiness and capabilities. BTO's programs operate across a wide range of scales, from individual cells

to the warfighter to global ecosystems. BTO responds to the urgent and long-term needs of the Department of Defense (DoD) and addresses national security priorities.
**Awards:** Multiple awards are possible. The amount of resources made available under this BAA will depend on the quality of the proposals received and the availability of funds.
**Proposal Deadline:** Proposal Abstracts and Full Proposals will be accepted on a rolling basis until April 23, 2020, 4:00 PM ET.
**Contact Information:** The BAA Coordinator for this effort may be reached at: BTOBAA2019@darpa.mil

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**Grant Program: DoD Spinal Cord Injury, Investigator- Initiated Research Award**
**Agency: Department of Defense Dept. of the Army – USAMRAA W81XWH-19-SCIRP-IIRA**
**Website**: https://www.grants.gov/web/grants/search-grants.html
**Brief Description:** The SCIRP IIRA is intended to support studies that have the potential to make an important contribution to SCI research, patient care, and/or quality of life.
Important aspects of this award mechanism include:
• **Impact:** Applications should articulate both the short- and long-term impact of the proposed research. Projects must address one or more of the FY19 SCIRP IIRA Focus Areas.
• **Relevance to Military Health:** Projects should be relevant to spinal cord-injured military Service members, Veterans, and/or their family members and caregivers. Collaboration with military and VA researchers and clinicians is encouraged.
• **Preliminary Data:** Observations that drive a research idea may be derived from laboratory discovery, population-based studies, a clinician's first-hand knowledge of patients, or anecdotal data. Applications must include preliminary and/or published data that are relevant to the mission of the SCIRP and support the proposed research project.
IIRA applications may focus on any phase of research from basic through translational. Permitted research includes preclinical studies in animal models, research with human subjects, or human anatomical substances, as well as ancillary studies associated with an existing clinical trial. ***Applications including animal studies must include a clear justification for the animal model chosen including relevance to human SCI.***
**Awards:** Various
**Proposal Deadline:** Pre-Application Submission Deadline: 5:00 p.m. Eastern time (ET), May 29, 2019 • Invitation to Submit an Application: July 2019 • Application Submission Deadline: 11:59 p.m. ET, August 27, 2019
**Contact Information:** CDMRP Help Desk Phone: 301-682-5507 Email: help@eBRAP.org

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**Grant Program: Military Medical Photonics Program**
**Agency: Department of Defense Air Force Office of Scientific Research FA9550-19-S-0004**
**Website**: https://www.wpafb.af.mil/Welcome/Fact-Sheets/Display/Article/842050/afosr-funding-opportunities/
**Brief Description:** The Air Force Office of Scientific Research (AFOSR) seeks unclassified proposals for broadbased research and development aimed at using lasers and other light source technology to develop applications in medicine, photobiology, surgery, and closely related materials sciences, with applications to combat casualty care and other military medical problems. This announcement is primarily directed toward university-based medical institutions; however, all qualified and responsible prime applicants located in the United States are eligible to submit proposals. The highest priority will be extended to proposals up to three (3) years duration to be conducted by teams of physicians, biomedical scientists, physical scientists, and engineers. The efforts proposed may be basic or applied research, and

must have direct relevance to combat casualty care or other military medical priorities. Applicants must demonstrate substantial experience working to further military medical priorities, including transitioning research into clinical practice and working products. Substantial experience collaborating with military medical centers is also a requirement to establish relevance to combat casualty care or other military medical priorities, and facilitate the transition of research results to meet military needs.
**Awards:** Various
**Proposal Deadline:** This BAA will remain open until superseded. However any currently available funds must be obligated by 30 September, 2019, and so proposals for those funds must be received before 30 June 2019. Further, applicants are encouraged to apply as early as practicable, since proposals may be reviewed and selected as received, and currently available funds may be used up prior to that date.
**Contact Information:** CDMRP Help Desk Phone: 301-682-5507 Email: help@eBRAP.org

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**Grant Program: Research Interests of the Air Force Office of Scientific Research**
**Agency: Department of Defense Air Force Office of Scientific Research FA9550-19-S-0003**
**Website**: http://www.wpafb.af.mil/afrl/afosr
**Brief Description:** Our focus is on research areas that offer significant and comprehensive benefits to our national warfighting and peacekeeping capabilities. These areas are organized and managed in two scientific branches: ♣ Engineering and Information Sciences(RTA) ♣ Physical and Biological Sciences (RTB)

1. ENGINEERING AND COMPLEX SYSTEMS(RTA1) Research proposals are sought in all aspects of the chemistry and physics of energetic materials with particular emphasis on chemistry-microstructure relationships and the fundamental dynamics of heterogeneous materials with complex structural properties. The problems of interest span multiple time and length scales, and strongly couple a broad range of physical phenomena, presenting fundamental challenges in experimental characterization, data assimilation, and model development. Efforts that leverage recent breakthroughs in other scientific disciplines to foster rapid research advancements are also encouraged.
1. INFORMATION AND NETWORKS (RTA2) The Information and Networks Team within the Engineering and Information Science Branch is organized to support many U.S. Air Force priority areas including autonomy, space situational awareness, and cyber security. The research programs within this team lead the discovery and development of foundational issues in mathematical, information and network oriented sciences. They are organized along three themes: Information, Decision Making, and Networks. The information theme addresses the critical challenges faced by the U.S. Air Force which lie at the intersection of the ability to collect, mathematically analyze, and disseminate large quantities of information in a time critical fashion with assurances of operation and security. Closely aligned with the mathematical analysis of information is the need for autonomous decision making. Research in this theme focuses on the discovery of mathematical laws, foundational scientific principles, and new, reliable and robust algorithms, which underlie intelligent, mixed human-machine decision-making to achieve accurate real-time projection of expertise and knowledge into and out of the battle space. Information analysis and decision making rarely occur in the context of a single source. The networks theme addresses critical issues involving how the organization and interaction among large collections of information providers and consumers contributes to an understanding of the dynamics of complex information systems.
2. PHYSICAL SCIENCES(RTB1) The Physical Sciences Team leads the discovery and transition of foundational physical science to enable air, space, and cyber power. Research in physics generates the fundamental knowledge needed to advance U.S. Air Force operations, from the perspective of sensing, characterizing, and managing the operational environment as well as developing advanced devices that exploit novel physical principles to bring new capabilities to the

warfighter. Research directions are categorized in the following four broad areas, with the focus on advancing our basic understanding of the physical world: (1) Quantum matter and devices; (2) plasma and high-energy-density physics; (3) optics, photonics, and electromagnetics; and (4) aerospace materials.

3. CHEMISTRYAND BIOLOGICAL SCIENCES (RTB2) The Chemistry and Biological Sciences Team is responsible for research activities in chemistry and biological sciences. A wide range of fundamental chemistry, biology, mechanics, and biophysics research is supported to provide the Air Force with novel options to increase performance and operational flexibility. Research carried out within this team will help usher in revolutionary new technologies that will fundamentally change the way future Air Force weapon systems are designed and implemented. This research effort will endeavor to identify chemical and biological mechanisms, structures, and systems with the potential to inspire future technology in all Air Force systems. Understanding these mechanisms, structures and systems at a fundamental level will accelerate advances in energy technology, control of complex systems, sensors and sensory systems, and materials engineering.

**Awards:** Approximately $300 million is anticipated to be available for support of actions awarded under this announcement, subject to availability of funds. Research proposals funded between $200,000 and $400,000 per year are encouraged. Most of our awards are three (3) years in duration. Awards may be proposed for not more than five (5) years.
**Proposal Deadline:** Until the BAA is suspended.
**Contact Information:** CALVIN D. SCOTT, AFOSR/RBKC Senior Procurement Analyst Email: afosr.baa@us.af.mil

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**Grant Program: DoD Autism Idea Development Award**
**Agency: Department of Defense Dept. of the Army – USAMRAA W81XWH-19-ARP-IDA**
**Co-RFP: W81XWH-19-ARP-CTRA DoD Autism Clinical Translational Research Award**
**Website**: https://cdmrp.army.mil/funding/arp
**Brief Description:** The ARP Idea Development Award supports the development of innovative, high-risk/highreward research that could lead to critical discoveries or major advancements that will accelerate progress in improving outcomes for individuals with ASD. This award mechanism is designed to support innovative ideas with the potential to yield impactful data and new avenues of investigation.

The FY19 ARP Idea Development Award seeks applications from all areas of basic and preclinical research and strongly encourages applications that address the critical needs of the ASD community in one or more of the following areas: • Assessment of novel therapeutics using valid preclinical models • Environmental risk factors • Mechanisms of heterogeneous clinical expression of ASD • Mechanisms underlying conditions co-occurring with ASD (e.g., sleep disturbances, gastrointestinal issues, inflammation, aggression, depression, anxiety, attention deficit, seizures, eating disorders, pharmacologic side effects, gender dysphoria) • Factors promoting success in key transitions to independence for individuals living with ASD • Factors impacting quality of life during geographic relocation, such as military permanent change of station • Development of healthcare provider-focused training or tools to improve healthcare delivery for individuals with ASD across the life span and the continuum of care (i.e., primary care, urgent/emergent care, and disaster relief) • Improve diagnosis and access to services across the life span
**Awards:** The anticipated direct costs budgeted for the entire period of performance for an FY19 ARP Idea Development Award will not exceed $500,000.
**Proposal Deadline:** Pre-Application Submission Deadline: 5:00 p.m. Eastern time (ET), May 1, 2019 • Invitation to Submit an Application: June 10, 2019 • Application Submission Deadline: 11:59 p.m. ET, August 8, 2019
**Contact Information:** CDMRP Help Desk Phone: 301-682-5507 Email: help@eBRAP.org

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**Grant Program: Real Time Machine Learning (RTML)**
**Agency: Department of Defense DARPA - Microsystems Technology Office HR001119S0037**
**Website**:
https://www.fbo.gov/index?s=opportunity&mode=form&id=a32e37cfad63edcba7cfd5d997422d93&tab=core&_cview=1
**Brief Description:** A grand challenge in computing is the creation of a processor that can proactively interpret and learn from data in real-time, solve unfamiliar problems using what it has learned, and operate with the energy efficiency of the human brain. The National Science Foundation (NSF) and the Defense Advanced Research Projects Agency (DARPA) are teaming up through the Real-Time Machine Learning (RTML) program to develop the foundational breakthroughs in hardware and machine learning needed to build systems that respond and adapt in real time.

The Microsystems Technology Office at DARPA is soliciting innovative research proposals in the area of real time machine learning hardware. The Real Time Machine Learning program will develop machine-learning hardware generators and explore circuit architectures that can proactively interpret and learn from data, solve unfamiliar problems using what it has learned, and operate at power levels on par or better than the human brain. Proposed research should investigate innovative approaches that enable revolutionary advances in science, devices, or systems.
**Awards:** Multiple awards; Available Funding $10,000,000
**Proposal Deadline:** Proposers Day: April 2, 2019 o FAQ Submission Deadline: 1:00 PM on April 15, 2019 o Proposal Due Date: 1:00 PM on May 1, 2019
**Contact Information:** Andreas Olofsson, Program Manager BAA Coordinator: HR001119S0037@darpa.mil

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**Grant Program: Science of Artificial Intelligence and Learning for Open-world Novelty (SAIL-ON)**
**Agency: Department of Defense DARPA - Defense Sciences Office HR001119S0038**
**Website**:
https://www.fbo.gov/index?s=opportunity&mode=form&id=42d0a9427a1f878b0ce99fcaabb6c645&tab=core&_cview=1
**Brief Description:** The Defense Sciences Office (DSO) of the Defense Advanced Research Projects Agency (DARPA) is soliciting innovative research proposals for new AI methodologies and techniques that support (1) the principled characterization and generation of novelty in open worlds and (2) the creation of AI systems capable of operating appropriately and effectively in open worlds. 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.
**Awards:** Multiple Awards
**Proposal Deadline:** Proposers Day: March 5, 2019. See Section VIII.C. o Abstract Due Date: April 2, 2019, 4:00 p.m. o FAQ Submission Deadline: April 30, 2019, 4:00 p.m. See Section VIII.A. o Full Proposal Due Date: May 10, 2019, 4:00 p.m.
**Contact Information:** Ted Senator, Program Manager, DARPA BAA Email: SAILON@darpa.mil

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**Grant Program: Air Force Fiscal Year 2020 Young Investigator Research Program (YIP)**
**Agency: Department of Defense Air Force Office of Scientific Research FOA-AFRL-AFOSR-2019-0003**

**Website**: https://www.wpafb.af.mil/Welcome/Fact-Sheets/Display/Article/842100/afosr-funding-opportunities-special-programs/#anchor2
**Brief Description:** The Air Force YIP supports scientists and engineers who have received Ph.D. or equivalent degrees within the last seven years and show exceptional ability and promise for conducting basic research. The objectives of this program are:
1.to foster creative basic research in science and engineering;
2. enhance early career development of outstanding young investigators;
3. and increase opportunities for the young investigator to recognize the Air Force mission and related challenges in science and engineering.
**Eligibility:** Individual awards are made to U.S. institutions of higher education, industrial laboratories, or non-profit research organizations where the principal investigator (PI) is employed on a full-time basis and holds a regular position. YIP PIs must be a U.S. citizen, national, or permanent resident. Researchers working at a Federally Funded Research and Development Center or DoD Laboratory are not eligible for this competition. Research proposals must address Research Interests of the Air Force Office of Scientific Research, FA9550-18-S-0003, found on www.grants.gov.
**Awards:** Most YIP awards are funded up to $150,000 per year for three years, for a total of $450,000. Exceptional proposals will be considered individually for higher funding levels and/or longer duration.
**Proposal Deadline:** May 31, 2019
**Contact Information:** Ellen M. Robinson (703) 588-8527 DSN 425-8527 Email: afosryip@us.af.mil

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**Grant Program: Multidisciplinary Research Program of the University Research Initiative: FY20 ARMY and FY20 AFOSR**
**Agency: Department of Defense Dept of the Army -- Materiel Command W911NF-19-S-0008**
**Air Force Office of Scientific Research FOA-AFRL-AFOSR-2019-0002**
**Website**: https://www.arl.army.mil/www/default.cfm?page=8 for US Army Funding
https://www.wpafb.af.mil/Welcome/Fact-Sheets/Display/Article/842111/afosr-funding-opportunities-university-research-initiative-uri/#anchor2 for AFOSR
**Brief Description:** The MURI program supports basic research in science and engineering at U.S. institutions of higher education (hereafter referred to as "universities") that is of potential interest to DoD. The program is focused on multidisciplinary research efforts where more than one traditional discipline interacts to provide rapid advances in scientific areas of interest to the DoD. Basic research is 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. It includes all scientific study and experimentation directed toward increasing fundamental knowledge and understanding in those fields of the physical, engineering, environmental, and life sciences related to long-term national security needs. It is farsighted high payoff research that provides the basis for technological progress (DoD 7000.14-R, vol. 2B, chap. 5, para. 050201.B).DoD's basic research program invests broadly in many specific fields to ensure that it has early cognizance of new scientific knowledge. DoD's basic research program invests broadly in many fields to ensure that it has early cognizance of new scientific knowledge.
**Awards:** Various; Available funding: $180,000,000. It is anticipated that awards under this topic will be no more than an average of $1.5M per year for 5 years, supporting no more than 8 funded faculty researchers. Exceptions warranted by specific proposal approaches should be discussed with the topic chief during the white paper phase of the solicitation.
**Proposal Deadline:** White Paper Inquiries and Questions 24 May 2019 (Friday) White Papers must be received no later than 03 June 2019 (Monday) at 11:59 PM Eastern Time Application Inquiries and Questions 30 August 2019 (Friday) Applications must be received no later than 13 September 2019 (Friday) at 11:59 PM Eastern Time

**Contact Information:** Kia S McCormick Procurement Analyst Phone 919-549-4281
Dr. Michael R. Berman, AFOSR, 703-696-7781, michael.berman@us.af.mil Dr. Aura Gimm, AFOSR, 703-696-9542, jung-hwa.gimm.1@us.af.mil

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**Grant Program: Department of Defense Multidisciplinary Research Program of the University Research Initiative (ONR)**
**Agency: Department of Defense Office of Naval Research N00014-19-S-F005**
**Website**:
https://www.fbo.gov/index?s=opportunity&mode=form&id=90876d7b71e42be9ba9a2f475bbc782d&tab=core&_cview=1
**Brief Description:** The MURI program supports basic research in science and engineering at U.S. institutions of higher education (hereafter referred to as "universities") that is of potential interest to DoD. The program is focused on multidisciplinary research efforts where more than one traditional discipline interacts to provide rapid advances in scientific areas of interest to the DoD. As defined in the DoD Financial Management Regulation: Basic research is 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. It includes all scientific study and experimentation directed toward increasing fundamental knowledge and understanding in those fields of the physical, engineering, environmental, and life sciences related to long-term national security needs. It is farsighted high payoff research that provides the basis for technological progress.
**Awards:** Various
**Proposal Deadline:** White Paper Inquiries and Questions 24 May 2019 (Friday) White Papers must be received no later than 03 June 2019 (Monday) at 11:59 PM Eastern Time Application Inquiries and Questions 30 August 2019 (Friday) Applications must be received no later than 13 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: Army Research Laboratory Broad Agency Announcement for Basic and Applied Scientific Research**
**Agency: Department of Defense Dept of the Army -- Materiel Command W911NF-17-S-0003**
**Also Army Research Office Broad Agency Announcement for Basic and Applied Scientific Research W911NF-17-S-0002**
**Website**:
https://www.fbo.gov/index?s=opportunity&mode=form&tab=core&id=1ff4626a4e06143fe31e4b837e890c6f
**Brief Description:** This Broad Agency Announcement (BAA) sets forth research areas of interest of the Army Research Laboratory (ARL). This BAA is issued under FAR 6.102(d)(2), which provides for the competitive selection of basic and applied research proposals, and 10 U.S.C. 2358, 10 U.S.C. 2371, and 10 U.S.C. 2371b, which provide the authorities for issuing awards under this announcement for basic and applied research. The definitions of basic and applied research may be found at 32 CFR 22.105. Proposals submitted in response to this BAA and selected for award are considered to be the result of full and open competition and in full compliance with the provision of Public Law 98-369, "The Competition in Contracting Act of 1984" and subsequent amendments. Eligible applicants under this BAA include institutions of higher education, nonprofit organizations, state and local governments, foreign organizations, foreign public entities, and for-profit organizations (i. large and small businesses) for scientific research in mechanical sciences, mathematical sciences, electronics, computing science, physics, chemistry, life sciences, materials science, network science, and environmental sciences.

**Awards:** Various.
**Proposal Deadline:** This BAA is a continuously open announcement valid throughout the period from the date of issuance through March 31, 2022, unless announced otherwise.
**Contact Information: ANDREW L. FISKE PROCUREMENT ANALYST Phone: (919) 549-4338**

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**Grant Program: 2019 ERDC Broad Agency Announcement**
**Agency: Department of Defense; Engineer Research and Development Center W912HZ-19-BAA-01**
**Website**: https://www.erdc.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 . You may also contact Reginald Bryant at 601-634-7166.

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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

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: Chemical Mechanisms to Address New Challenges in Air Quality Modeling**
**Early Career: Chemical Mechanisms to Address New Challenges in Air Quality Modeling**
**Agency: Environmental Protection Agency EPA-G2019-STAR-C1** EPA-G2019-STAR-C2
**Website**: https://www.epa.gov/research-grants/chemical-mechanisms-address-new-challenges-air-quality-modeling

**Brief Description:** The U.S. Environmental Protection Agency (EPA), as part of its Science to Achieve Results (STAR) program, is seeking applications proposing research to improve air quality models relevant to ozone, particulate matter (PM), regional haze, air toxics, and emerging pollutants. Specifically, this Request for Applications (RFA) is seeking research on the development of the component of an air quality model that represents the relevant atmospheric chemical reactions, which is known in this field of modeling as "the chemical mechanism." The RFA seeks research on:

1. Development of data, methods, and software tools for generating explicit chemical mechanisms that a) have a coherent and integrated treatment of gas, aerosol, aqueous, and heterogenous chemistry, b) can be easily updated to reflect evolving kinetic, mechanistic, and theoretical knowledge and understanding, and c) are applicable to a wide range of atmospheric concentration regimes and environmental conditions;
2. Development and evaluation of algorithms, numerical techniques and software tools to reduce (i.e., simplify) detailed, integrated chemical mechanisms into application-specific condensed mechanisms appropriate for use in global and regional air quality models; and
3. Applications of new condensed mechanisms generated for broad applications or for specific conditions in global and regional air quality models to investigate air quality research topics relevant to air quality management in the United States.

The focus of this solicitation is on the development of chemical mechanisms relevant over multiple regimes (a wide range of concentrations, oxidant ratios, and temperatures, and multiple phases) and spatiotemporal scales within a framework that can generate mechanisms for current air quality assessments and have the flexibility to generate updated mechanisms as understanding of atmospheric chemistry evolves and new concerns emerge.

**Awards:** Potential Funding per Award: Up to a total of $800,000 for regular awards, and up to a total of $400,000 for early career awards, including direct and indirect costs, with a maximum duration of three years.
**Submission Deadline:** June 24, 2019: 11:59:59 pm Eastern Time
**Contact:** Technical Contact: Serena Chung; phone: 202-564-6069; email: chung.serena@epa.gov Eligibility Contact: Ron Josephson; phone: 202-564-7823; email: josephson.ron@epa.gov Electronic Submissions Contact: Debra M. Jones; phone: 202-564-7839; email: jones.debram@epa.gov

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**Grant Program: 2019 Healthy Communities Grant Program**
**Agency: Environmental Protection Agency EPA-R1-HC-2019**
**Website**: https://www3.epa.gov/region1/eco/uep/pdfs/2019-hcgp-rfa.pdf
**Brief Description:** The Healthy Communities Grant Program is the U.S. Environmental Protection Agency, Region 1's (EPA New England) main competitive grant program to work directly with communities to support EPA's "Back-to- Basics" agenda to reduce environmental risks, protect and improve human health and improve the quality of life. The Healthy Communities Grant Program will achieve these goals through identifying and funding projects that: • Target resources to benefit communities at risk [areas needing to create community resilience, environmental justice areas of potential concern, sensitive populations (e.g., children, elderly, tribes, urban and rural residents, and others at increased risk)]. • Assess, understand, and reduce environmental and human health risks. • Increase collaboration through partnerships and community-based projects. • Build institutional and community capacity to understand and solve environmental and human health problems. • Advance emergency preparedness and ecosystem resilience. • Achieve measurable environmental and human health benefits. To qualify as eligible projects under the Healthy Communities Grant Program, proposed projects must: (1) be located in and/or directly benefit one or more of the Target Investment Areas; and (2) identify how the proposed project will achieve measurable environmental and/or public health results in one or more of the Target Program Areas. Please see Section III for further information on eligibility requirements.
**Awards:** Proposals may be submitted for amounts up to $25,000. The project period will start no earlier than October 1, 2019 and can last for a one or two-year period.
**Letter of Intent Deadline:** Your organization's AOR must submit your complete application package electronically to EPA through Grants.gov no later than May 28, 2019, 11:59 PM ET.
**Contact:** Katie Marrese EPA New England 5 Post Office Square, Suite 100 (OEP06-2) Boston, MA 02109-3912 Phone: 617-918-1658 Fax: 617-918-0658 Marrese.Katie@epa.gov

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**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: Low Cost, Efficient Treatment Technologies for Produced Water**
**Agency: Department of Energy DE-FOA-0002004**
**Website**:
https://www.fedconnect.net/FedConnect/PublicPages/PublicSearch/Public_OpportunitySummary.aspx

**Brief Description:** There are a number of water treatment technologies that include chemical, electrostatic, flotation, filtration and thermal methods. Often, combinations of these methods are incorporated into a range of proprietary commercial systems. Such systems typically produce an output stream of relatively clean water suitable for reuse, plus a second lower volume output stream of highly concentrated brine that cannot be reused and that must be disposed.

DOE understands that produced water characteristics reflect the chemistry of the geologic formation in which it resides. **Accordingly, DOE expects applications in response to this FOA to be basin-specific, reflecting produced water constituents, volumes, and the supply/ demand water-balance of the region.** DOE recognizes that the techno-economic relationship among these variables will determine the potential for a technology application's economic success in any specific location.

Developing such efficiency improvements and technologies would serve to reduce the need for deep well injection and help to support the water supply needs of both oilfield and non-oilfield industries, while simultaneously advancing the economic benefits of continued conventional and unconventional oil and natural gas development activities and U.S. energy independence.

The objective of this Oil and Gas FOA is to accelerate the development of potential process modifications, combinations or enhancements, or altogether new alternative processes and technologies-- including techno-economic analyses--that could achieve significant reduction in the quantity of produced water going to deep, underground injection well facilities. Commercialization of treatment technologies that reduce waste water and, create fit for purpose water supplies support the Produced Water Research and Development program, is another objective of this work. DOE's objective is to publish these detailed process enhancement design analyses to encourage private funding of their development and to stimulate additional public and private research which includes a university or nonprofit performer / subperformer. In addition, DOE seeks to accelerate technology advancement of these technology solutions through funding continued laboratory scale research and development. This FOA solicits applications for the completion of such analytical products and continued technology development at the laboratory scale.

**Awards:** 4 awards; Available funding: $5,000,000
**Proposal Submission Deadline:** July 10, 2019
**Contact:** Jodi.Collins@netl.doe.gov

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**Grant Program: Buildings Energy Efficiency Frontiers & Innovation Technologies (BENEFIT) – 2019**

**Agency: Department of Energy DE-FOA-0002090**

**Website**: https://eere-exchange.energy.gov/#FoaId621e495c-6186-48da-8308-3f8f3841ba37

**Brief Description:** This Funding Opportunity Announcement (FOA) is being issued by the U.S. Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy (EERE) Building Technologies Office (BTO). BTO's overall goal is to improve the energy productivity of buildings without sacrificing occupant comfort or product performance. The goal is to use energy more productively and efficiently, not simply to use less energy. Progress towards achieving this goal will make building energy costs more affordable to the benefit of American families and businesses.

BTO research is focused on reducing energy intensity for major segments of the sector with the most opportunity for energy savings, while balancing the need to maintain occupant comfort and productivity, and product performance. This includes both new and existing buildings, both residential and commercial, including their energy-consuming and labor-saving equipment. The development of next-generation building technologies, including building materials, components, equipment, energy models and systems, is critical to increasing energy productivity in a cost-effective manner.

BTO's Emerging Technologies (ET) program invests in the research and development to create the next-generation building technologies, tools and systems to enhance energy efficiency. The program focuses on the most energy-intensive technologies for residential buildings and in commercial buildings, where the opportunity for cost-effective energy savings is greatest. These technologies include air conditioning, space heating, water heating, lighting and sensors & controls, all of which are addressed in this FOA.

Achieving BTO's priorities across the building technology landscape requires sustained, multifaceted innovation. With this FOA, BTO intends to fund high-impact, early-stage research in the following areas:

Topic 1: Flexible Building Technologies
Topic 2: Heating, Ventilation and Air Conditioning (HVAC) Technologies
Topic 3: Solid-State Lighting (SSL) Technologies

**Awards:** Available Funding $47,000,000

**Proposal Submission Deadline:** Concept Paper Submission Deadline: 5/21/2019 5:00 PM ET

- Full Application Submission Deadline: 7/15/2019 5:00 PM ET

**Contact:** EERE-ExchangeSupport@hq.doe.govEERE eXCHANGE

- BENEFIT-FOA0002090@netl.doe.govFOA Questions

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**Grant Program: Request for Information (RFI): Research and Development Opportunities for Building Energy Modeling**

**Agency: Department of Energy DE-FOA-0002118**

**Website**: https://eere-exchange.energy.gov/#FoaIda15ee998-ee10-488a-880e-c882279cca16

**Brief Description:** The U.S. Department of Energy's (DOE), Building Technologies Office (BTO) is issuing this Request for Information (RFI) on Research and Development Opportunities for Innovations in Sensors and Controls for Building Energy Management.

Through this RFI, BTO seeks input on its recently developed R&D opportunities document for the integration and optimization of systems at the whole-building level through connected and controllable loads for increased energy affordability, improved occupant comfort, and enhanced provision of grid services that will strengthen the integration between buildings, other distributed energy resources, and the electric grid. This document will inform BTO's strategic planning moving forward in identifying early-stage and innovative technology solutions to meet these goals. Successful solutions will strengthen the affordability, reliability, and resiliency of the energy consumed by the buildings sector, contributing to DOE's priorities for the energy sector as a whole.

**Request for Information Categories:**

**Category 1**: **Multi-Functional Wireless Sensor Networks**

**Category 2**: **Advanced Monitoring and Data Analytics**

**Category 3**: **Adaptive and Autonomous Controls**

**Category 4**: **Occupant-Centric Controls**

**Category 5**: **Overarching Areas of Interest and Cross-cut Strategies**

The purpose of this RFI is to solicit feedback from industry, academia, research laboratories, government agencies, and other stakeholders on issues related to sensor and control technologies for optimizing building energy management. This information will be used by BTO to update its Sensors and Controls R&D strategy and supporting energy savings and cost reduction goals, as well as to inform future strategic planning and adjustments to its R&D portfolio. This is solely a request for information and not a Funding Opportunity Announcement (FOA). EERE is not accepting applications.

**Awards:** This is a Request for Information (RFI) only. EERE will not pay for information provided under this RFI and no project will be supported as a result of this RFI. This RFI is not accepting applications for financial assistance or financial incentives. EERE may or may not issue a Funding Opportunity Announcement (FOA) based on consideration of the input received from this RF**I.**

**Submission Deadline: Responses to this RFI must be submitted electronically to BTO_SensorsControls_RDO@ee.doe.gov no later than 5:00pm (ET) on June 3, 2019.** Responses must be provided as attachments to an email. It is recommended that attachments with file sizes exceeding 25MB be compressed (i.e., zipped) to ensure message delivery. Responses must be provided as a Microsoft Word (.docx) attachment to the email, and no more than 10 pages in length, 12 point font, 1 inch margins. Only electronic responses will be accepted.

**Contact:** BTO_SensorsControls_RDO@ee.doe.gov

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**Grant Program: Request for Information (RFI): Research and Development Opportunities for Innovations in Sensors and Controls for Building Energy Management**

**Agency: Department of Energy DE-FOA-0002117**
**Website**: https://eere-exchange.energy.gov/#FoaId7b9f4e2b-3f90-4015-b765-c3a7b972633c
**Brief Description:** The United States (U.S.) Department of Energy (DOE) Building Technologies Office (BTO) is seeking input from the public about its Research and Development Opportunities for Building Energy Modeling (BEM). In particular, BTO is interested in feedback on planned initiatives and their prioritization, on program scope, and on data-sets, metrics and targets for assessing program effectiveness and impact.
The purpose of this RFI is to solicit feedback from industry, academia, research laboratories, government agencies, and other stakeholders on BTO's BEM program and its future directions and priorities. To clarify these, BTO has developed a report that is structured around six focus areas (the BEM value proposition, predictive accuracy of BEM, core modeling capabilities, workflow integration and automation, the BEM data ecosystem, and BEM professionals). The report identifies barriers to the increased adoption of BEM and proposing a set of initiatives to address them. BTO is requesting feedback on each of these barriers, the associated initiatives, as well as barriers and initiatives that have not been identified. BTO is also requesting feedback on datasets, metrics, and targets for assessing the impact and progress of the BEM industry and its own BEM program.
**Request for Information Categories:**
**Category 1: Metrics, benchmarks, targets, and data sets for tracking the use of BEM in various building energy building energy efficiency projects. Methods of attributing energy-efficiency to BEM in various applications.**
**Category 2: Focus areas**
**Category 3: Barriers**
**Category 4: Initiatives**
**Category 5: Stakeholder engagement and feedback mechanisms**
**Category 6: Other Feedback**
**Awards:** This RFI is not a Funding Opportunity Announcement (FOA); therefore, EERE is not accepting applications at this time. EERE may issue a FOA in the future based on or related to the content and responses to this RFI; however, EERE may also elect not to issue a FOA. There is no guarantee that a FOA will be issued as a result of this RFI. Responding to this RFI does not provide any advantage or disadvantage to potential applicants if EERE chooses to issue a FOA regarding the subject matter. Final details, including the anticipated award size, quantity, and timing of EERE funded awards, will be subject to Congressional appropriations and direction.
**Submission Deadline:** Responses to this RFI must be submitted electronically to BTO_BEM_RDO@ee.doe.gov no later than 5:00pm (ET) on June 3, 2019. Responses must be provided as attachments to an email. It is recommended that attachments with file sizes exceeding 25MB be compressed (i.e., zipped) to ensure message delivery. Responses must be provided as a Microsoft Word (.docx) attachment to the email, and no more than 10 pages in length, 12 point font, 1 inch margins. Only electronic responses will be accepted.
**Contact:** BTO_BEM_RDO@ee.doe.gov

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**NASA**

**Grant Program: ROSES 2019: B.7 Space Weather Science Applications Operations 2 Research**
**Agency: NASA NNH19ZDA001N-SWO2R**
**Website**: https://nspires.nasaprs.com/external/solicitations/summary.do?solId={BD18A167-6DE8-1A35-A0ED-96F16AC6DE49}&path=&method=init
**Brief Description:** In October 2015, the National Science and Technology Council (NSTC) in the Executive Office of the President released the National Space Weather Strategy and the National Space

Weather Action Plan (SWAP). In March 2019, these were updated with the release of the National Space Weather Strategy and Action Plan (NSW-SAP). The objectives of the actions described in the SWAP and NSW-SAP are to improve the understanding of, forecasting of, and preparedness for space weather events, recognizing the need for close cooperation among the federal agencies. The SWAP and NSW-SAP call for NASA, National Science Foundation (NSF), and Department of Defense (DOD) to identify and support basic research on space weather. They also direct NASA, Department of Commerce (DOC), and DOD to identify and support research opportunities that address targeted operational space-weather needs. Furthermore, they direct NASA, NSF, DOC, and DOD to facilitate the transition of space weather information and prediction capabilities to the Nation's space weather service providers (research-to-operations and operations-to-research). In response to the need to advance and coordinate the Nation's space weather research and operations capabilities, NASA has established the Heliophysics Space Weather Science Applications program, of which this operations-to-research (O2R) call is a part. NASA is supporting this funding opportunity in coordination with DOC/National Oceanic and Atmospheric Administration (NOAA) to promote O2R activities. For this call, the objective of O2R efforts is broadly defined as the joint pursuit of improvements of operational capabilities and advancements in related fundamental research.

The primary goal of this funding is to support research by the grant recipient to improve numerical models and/or data utilization techniques that could advance specification and/or forecasting capabilities and which could also lead to improved scientific understanding. Effective utilization of available data is encouraged. Employing data assimilation and/or machine-learning techniques is also encouraged.

**Awards:** Various

**Proposal Deadline:** Step-1 Proposal: December 16, 2019

**Contact:** James Spann Heliophysics Division Science mission Directorate NASA Headquarters Washington, DC 20546-0001 Telephone: 202-358-0574 Email: jim.spann@nasa.gov

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**Grant Program: Heliophysics Theory, Modeling, and Simulations: due dates TBD**
**Agency: NASA NNH19ZDA001N-HTMS**

**Website**: https://nspires.nasaprs.com/external/solicitations/summary.do?solId=%7B97F8C4AD-A0D1-7593-92DD-0418FE347186%7D&path=&method=init

**Brief Description:** The Heliophysics Theory, Modeling, Simulations (H-TMS) program is a component of the Heliophysics Research Program. Proposers interested in this program element are encouraged to see the overview of the Heliophysics Research Program in Appendix B.1 of this ROSES NRA. The H-TMS program was previously one element of the Heliophysics Grand Challenges Research (H-GCR) program (H-GCR-TMS, last competed in ROSES-2016 as program element B.5). Before that it was called "Heliophysics Theory Program" (HTP, last competed in ROSES-2013). For simplification, this program is now referred to as the Theory, Modeling, and Simulations (TMS) element in the Heliophysics program. The former Heliophysics Theory Program provides the foundation of the TMS element. Increasingly, as computing power becomes more affordable and more available, numerical simulations and modeling become tools that can and have been used synergistically with data analyses and rigorous theory development to solve the fundamental problems of Heliophysics. They lead the way to new understanding and drive science concepts for future strategic missions. The ultimate goal of TMS investigations is to provide a complete chain of reasoning extending from the basic laws of nature to comparison with observation to the identification of future quantitative tests of the behavior of the environment. NASA acknowledges this and renames the element "Theory, Modeling, and Simulations."

**Awards:** Various

**Notice of Intent:** Not Required

**Proposal Deadline:** TBD; Program Close date: Feb 14, 2020

**Contact:** Ekaterina Verner Heliophysics Division Science Mission Directorate NASA Headquarters Washington, DC 20546-0001 Telephone: (202) 358-1213 Email: ekaterina.m.verner@nasa.gov

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**Grant Program: Astrophysics Research and Analysis: due dates TBD**
**Agency: NASA NNH19ZDA001N-APRA**
**Website**: https://nspires.nasaprs.com/external/solicitations/summary.do?solId=%7B90F8A275-496D-A0FA-82A0-0BF6E9ABBA67%7D&path=&method=init
**Brief Description:** The Astrophysics Research and Analysis Program (APRA) program solicits basic research proposals for investigations that are relevant to NASA's programs in astronomy and astrophysics and includes research over the entire range of photons, gravitational waves, and particle astrophysics. Awards may be for up to four years' duration (up to five years for suborbital investigations), but shorter-term proposals are typical; four-year or five-year proposals must be well justified. Proposals for suborbital investigations are particularly encouraged. APRA investigations may advance technologies anywhere along the full line of readiness levels, from Technology Readiness Level (TRL) 1 through TRL 9. The emphasis of this program element is on technologies and investigations that advance NASA astrophysics missions and goals.
**Awards:** Various
**Notice of Intent:** Not Required
**Proposal Deadline:** TBD; Program Close date: Feb 14, 2020
**Contact:** Dominic J. Benford Astrophysics Division Science Mission Directorate NASA Headquarters Washington, DC 20546-0001 Telephone: (202) 358-1261 Email: Dominic.Benford@nasa.gov

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**Grant Program: Heliophysics Data Environment Emphasis**
**Agency: NASA NNH19ZDA001N-HDEE**
**Website**: https://nspires.nasaprs.com/external/solicitations/summary.do?solId=%7BC2FBD0C9-081B-8A0E-B883-CF137C591C5D%7D&path=&method=init
**Brief Description:** The Heliophysics Data Environment Enhancements (HDEE) program is a component of the Heliophysics Research Program and proposers interested in this program element are encouraged to see the overview of the Heliophysics Research Program in B.1 of this ROSES NRA. The work carried out for this program should be in support of the Heliophysics strategic goals and objectives in NASA's 2018 Strategic Plan and Chapter 4.1 of the NASA 2014 Science Plan (both at https://science.nasa.gov/about-us/science-strategy). The recommended priorities of the Heliophysics community are also discussed in the National Research Council Decadal Strategy for Solar and Space Physics report, Solar and Space Physics: A Science for a Technological Society (http://www.nap.edu/catalog/13060/solar-and-space-physics-a-science-for-atechnological-society). Note particularly the sections of the Decadal report dealing with the "DRIVE" initiative, more specifically "R" and "I," and the discussion in Appendix B. The specific context of this call is provided by the NASA Heliophysics Science Data Management Policy (https://hpde.gsfc.nasa.gov/Heliophysics_Data_Policy_v1.2_2016Oct04.html).
**Awards:** Various
**Notice of Intent:** Not Required
**Proposal Deadline:** TBD; Program Close date: Feb 14, 2020
**Contact:** Jeffrey J. E. Hayes Heliophysics Division Science Mission Directorate NASA Headquarters Washington, DC 20546-0001 Telephone: (202) 358-0353 Email: jhayes@nasa.gov

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**National Endowment of Humanities**

**Grant Program: Digital Humanities Advancement Grants**
**Agency: National Endowment for the Humanities**
**Website**: https://www.neh.gov/grants/odh/digital-humanities-advancement-grants
**Brief Description:** Digital Humanities Advancement Grants (DHAG) support digital projects at different stages throughout their lifecycles, from early start-up phases through implementation and sustainability. Experimentation, reuse, and extensibility are hallmarks of this program, leading to innovative work that can scale to enhance scholarly research, teaching, and public programming in the humanities. This program is offered twice per year. Proposals are welcome for digital initiatives in any area of the humanities. Through a special partnership with NEH and pending the availability of appropriated funds, the Institute of Museum and Library Services (IMLS) anticipates providing additional funding to this program to encourage innovative collaborations between museum or library professionals and humanities professionals to advance preservation of, access to, use of, and engagement with digital collections and services. IMLS and NEH may jointly fund some DHAG projects that involve collaborations with museums and/or libraries. Digital Humanities Advancement Grants may involve • creating or enhancing experimental, computationally-based methods, techniques, or infrastructure that contribute to the humanities; • pursuing scholarship that examines the history, criticism, and philosophy of digital culture and its impact on society; or • conducting evaluative studies that investigate the practices and the impact of digital scholarship on research, pedagogy, scholarly communication, and public engagement.
**Awards:** Up to $375,000
**Deadlines:**
Optional Draft due: May 8, 2019
Application due: June 19, 2019
**Contact:** If you have questions about the program, contact the Office of Digital Humanities staff at odh@neh.gov. Applicants wishing to speak to a staff member by telephone should provide in an e-mail message a telephone number and a preferred time to call. odh@neh.gov

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**Grant Program: Research and Development Program**
**Agency: National Endowment for the Humanities**
**Website**: https://www.neh.gov/grants/preservation/research-and-development
**Brief Description:** The Research and Development program supports projects that address major challenges in preserving or providing access to humanities collections and resources. These challenges include the need to find better ways to preserve materials of critical importance to the nation's cultural heritage—from fragile artifacts and manuscripts to analog recordings and digital assets subject to technological obsolescence—and to develop advanced modes of organizing, searching, discovering, and using such materials.

This program recognizes that finding solutions to complex problems often requires forming interdisciplinary project teams, bringing together participants with expertise in the humanities; in preservation; and in information, computer, and natural science. The exact mix of specialists will depend on the particular nature of the project. Your project team should embody a well-defined humanities perspective that can frame your objectives and guide the project to successful completion. Such a perspective may be provided by members of an advisory committee, consultant(s), a project co-director, or another participant.
**Awards:** Maximum award amount: Tier I provides awards up to $75,000 Tier II provides awards up to $350,000
**Deadlines:**

Optional Draft due: April 3, 2019
Application due: May 15, 2019
**Contact:** 202-606-8570 preservation@neh.gov

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**Samsung**

**Grant Program: Global Research Outreach 2019**
**Agency: Samsung Advanced Institute of Technology (SAIT)**
**Website**: https://www.sait.samsung.co.kr/saithome/main/main.do
**Brief Description**: Samsung explore opportunities to build research partnerships with academia and research institutions for creating the future. SAIT is actively engaged in the pursuit of open innovation in order to foster the discovery of new ideas and technological breakthroughs. In order to develop core technologies along itself research directions, we have conducted research collaborations with outside. Also, We have strategic relationships closely with global universities to resolve the significantly challenging technology issues and achieve the collaboration results that align with strategic vision and goals of both parties.

Samsung offers a specific collaboration platform to global universities ; Global Research Outreach (GRO) program. GRO program is an annual call for proposals that invites the world's leading universities to propose innovative research ideas which will be evaluated for their novelty and alignment with Samsung's various research fields.

Topics include Machine Intelligence, Homomorphic Encryption, Physical and Mental Health, Autonomous Materials Development, Metaphotonics, Functional Oxide, Next-Gen Computing, Air Pollution Remediation, Semiconductor Materials, Ab Initio Reliability Simulation, Spintronics Materials & Devices, Halide Perovskite Materials.
**Awards:** Various
**Proposal Deadline:** June 25, 2019 (09:00 A.M. Korea Standard Time, UTC+9)

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**American Diabetes Association**

**Grant Program: Pathway Program**
**Agency: American Diabetes Association**
**Website**: https://professional.diabetes.org/meetings/pathway-stop-diabetes%C2%AE
**Brief Description:** ***The American Diabetes Association "Pathway" Program"*** invites nominations from a "broad range of disciplines, including biology, chemistry, engineering, mathematics and physics. The Association encourages nomination of individuals from diverse backgrounds, including minorities that are underrepresented in research."

Pathway seeks to bring new investigators and new perspectives to diabetes research. Supporting scientists with different backgrounds and experience is critical to achieving that objective. Pathway accepts nominations for exceptional investigators with medical and scientific backgrounds who propose innovative basic, clinical, translational, behavioral, epidemiological and health services research relevant to any type of diabetes, diabetes-related disease state or complication. Pathway solicits nominations for candidates in all disciplines as applied to diabetes including medicine, biology, chemistry, computing, physics, mathematics and engineering. In addition, nomination of scientists from diverse backgrounds, including minority groups that are underrepresented in biomedical research, is strongly encouraged.

***Three Award Categories:*** –

· Post-docs,

· Early Career
· Established Investigators.

**Pathway Award:** Up to $100,000/year in Phase 1, Up to $325,000/year in Phase 2. Maximum combined support for Phase 1 and Phase 2 is $1,625,000.
**Limited Nomination:** NJIT can submit only one nomination**.**
**Proposal Deadline:** July 1, 2019
**Contact:** If interested, please send an email to Atam Dhawan (dhawan@njit.edu).

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**Brain Research Foundation**

**Grant Program: 2020 Scientific Innovation Award**
**Agency: Brain Research Foundation**
**Website**: https://www.thebrf.org/for-researchers/scientific-innovations-award-2/
**Brief Description**: Brain Research Foundation (BRF) Annual Scientific Innovations Award supports innovative discovery science in both basic and clinical neuroscience. This funding mechanism is designed to support creative, cutting edge research in well-established research laboratories, under the direction of established investigators.
This funding opportunity is for projects that may be too innovative and speculative for traditional funding sources but still have a high likelihood of producing important findings in a very short time frame. It is expected that investigations supported by these grants will yield high impact findings and result in major grant applications and significant publications in high impact journals.

To be eligible, the nominee must be a **full-time associate professor/full professor** working in the area of neuroscience and brain function in health and disease. **Current major NIH or other peer-reviewed funding is preferred but evidence of such funding in the past three years is essential.** Download a PDF version of the 2020 Guidelines.
**Awards:** Each total award is limited to $150,000 (direct costs) for a two year grant period. Exact dates will be provided by the BRF upon application approval. The first grant payment of $75,000 will be made upon completion of the SIA Acceptance Form (January 2020). The final payment of $75,000 will be made contingent upon receipt of a Preliminary Progress and Financial Report (January 2021).
**Proposal Deadline:** The deadline to submit the nominated Letter of Intent is Friday, June 25, 2019.

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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/

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## Streamlyne Information

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

**Steamlyne_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.
**Steamlyne_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; and **Eric Hetherington,** Director, Sponsored Research Programs Administration 973-596-3631; 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
**Cristo Leon**, CSLA Director of Research; (973) 596-6426; cristo.e.yanezleon@njit.edu
**Sean Andrews**, YWCC Director of Research; (973) 596-5352; sean.t.andrews@njit.edu
**Iris Pantoja**, NCE, CoAD and MTSM Project Manager; 973-596-4483; 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) 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.

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