

NJIT Research Newsletter

Issue: ORN-2020-01

Happy New Year 2020!

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 <https://research.njit.edu/funding-opportunities>.

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Special Announcements

**U.S. R&D Increased by \$32 Billion in 2017, to \$548 billion
Estimate for 2018 Indicates a Further Rise to \$580 billion**

NSF 20-309 Report on website <https://www.nsf.gov/statistics/2020/nsf20309/?org=NSF>

New data from the National Center for Science and Engineering Statistics (NCSES) within the National Science Foundation indicate that research and experimental development (R&D)^[2] performed in the United States totaled \$547.9 billion in 2017 ([table 1](#)). The estimated total for 2018, based on performer-reported expectations, is \$580.0 billion. These numbers compare with U.S. R&D totals of \$493.7 billion in 2015 and \$406.6 billion in 2010. Here are the major highlights from the report.

The U.S. R&D system consists of the activities of a diverse group of R&D performers and sources of funding. Included here are private businesses, the federal government, nonfederal governments, higher education institutions, and other nonprofit organizations. The organizations that perform R&D often receive significant levels of outside funding, and organizations that fund R&D may also themselves be performers. The data for this InfoBrief mainly derive from NCSES surveys of the annual R&D expenditures of these performers and funders (see "[Data Sources and Availability](#)" for additional information).

The ratio of total national R&D expenditures to GDP is widely used by national statistical offices and other policy analysts as an overall gauge of the intensity of a nation's R&D effort. In this new edition of the *National Patterns* data, the ratio of U.S. R&D to GDP was 2.81% in 2017 and estimated to be 2.82% in 2018.^[4]

The U.S. ratio generally has been rising since the mid-1990s, though with some periods of decline ([figure 2](#)). The highest U.S. ratios recorded are 2.79% in 1964, 2.79% in 2009, 2.81% in 2017, and estimated 2.82% in 2018.[\[5\]](#)

Most of the rise in R&D-to-GDP ratio over the past several decades owes to the increase of nonfederal spending on R&D, particularly by the business sector. This arises largely from the growing role of business R&D in the national R&D system, which in turn reflects the increase of R&D-dependent goods and services in the national and global economies.

The business sector is by far the largest performer of U.S. R&D. In 2017, domestically performed business R&D accounted for \$400.1 billion, or 73% of the \$547.9 billion national R&D total ([tables 1](#) and [3](#))[\[6\]](#). The business sector's predominance in national R&D performance has long been the case, with its annual share ranging between 69% and 73% in 2000–17.[\[7\]](#)

Funds from the federal government accounted for \$121.0 billion, or 22%, of U.S. total R&D in 2017 ([table 1](#)). Federal funding was directed mainly to R&D performance by the federal government, businesses, and higher education ([table 3](#)). In 2017, federal funding supported about 51% of academic R&D performance; 6% of business R&D performance; 35% of nonprofit R&D performance; and almost all (98%) of FFRDC R&D performance.

R&D performed in the United States by the higher education sector totaled \$71.3 billion in 2017, or 13% of U.S. total R&D ([tables 1](#) and [3](#)). Over the period 2000–17, the higher education share of U.S. R&D has ranged between 11% and 14%.

The federal government performed \$52.6 billion, or 10%, of the U.S. R&D total in 2017 ([tables 1](#) and [3](#)). This included \$32.2 billion (6% of the U.S. total) performed by the intramural R&D facilities of federal agencies and \$20.3 billion (4%) performed by the 42 federally funded research and development centers (FFRDCs).

In 2017, basic research activities accounted for \$91.5 billion, or 17% of total U.S. R&D expenditures ([table 4](#)). Applied research was \$108.8 billion, or 20% of the total. Most of the total of U.S. R&D expenditures was experimental development at \$347.6 billion, or 63%.

Grant Opportunity Alerts

Keywords and Areas Included in the Grant Opportunity Alert Section Below

NSF: Spectrum and Wireless Innovation enabled by Future Technologies (SWIFT); Division of Integrative Organismal Systems Core Programs; International Research and education Network Connections (IRNC); Principles and Practice of Scalable Systems (PPoSS); Enabling Discovery through GENomic Tools (EDGE); Algorithms for Threat Detection (ATD); Competition for the Management of Operations and Maintenance of the National Ecological Observatory Network (NEON); NSF Innovation Corps Hubs Program; Small Business Technology Transfer Program Phase I (STTR); Small Business Innovation Research Program Phase I (SBIR); NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM); Early Career Development Program (CAREER); National Robotics Initiative 2.0: Ubiquitous Collaborative Robots (NRI-2.0); EHR Core Research (ECR):

Building Capacity in STEM Education Research (ECR: BCSER); Dear Colleague Letter: NSF/NSFC Joint Research on Environmental Sustainability Challenges

NIH: NIBIB Trailblazer Award for New and Early Stage Investigators (R21): Engineering Next-Generation Human Nervous System Microphysiological Systems (R21 and R01); BRAIN Initiative: Biology and Biophysics of Neural Stimulation and Recording Technologies (R01); Glial Plasticity in the Aging Brain (R01 Clinical Trial Not Allowed); Institutional Predoctoral Training Program in the Neurosciences (T32)

Department of Defense/US Army/DARPA/ONR: Fiscal Year (FY) 2021 Funding Opportunity Announcement (FOA) for the Office of Naval Research (ONR) Manufacturing Science Program; Quantum Characterization of Intermediate Scale Systems (QCISS); NRL Long Range Broad Agency Announcement (BAA) for Basic and Applied Research; C4ISR, Information Operations, Cyberspace Operations and Information Technology System Research, Air Superiority Technology Broad Agency Announcement; DSO Office-wide Broad Agency Announcement

Department of Transportation: Grants or Research Fellowship (GRF)

Department of Agriculture: Women and Minorities in STEM Fields; Integrated Research, Education, and Extension Competitive Grants Program – Organic Transitions; REAP-Renewable Energy Systems and Energy Efficiency Improvements

Department of Labor: Apprenticeships: Closing the Skills Gap

EPA: Solid Waste Recycling Enhancement Act (REA) Higher Education Research Grant Program

Department of Energy: National Quantum Information Science Research Centers; Seeding Critical Advances for Leading Energy Technologies with Untapped Potential; Extreme Environment Materials for Power Generation; FY20 Vehicle Technologies Program Wide Notice of Intent; Notice of Intent: FY20 Bioenergy Technologies Office Multi-Topic Funding Opportunity; FY 2020 Solicitation for the Office of Science Financial Assistance Program; Environmental System Science

NASA: ROSES 2019: Sustainable Land Imaging-Technology; Future Investigators in NASA Earth and Space Science and Technology; Heliophysics System Observatory Connect

National Endowment of Humanities: Institutes for Advanced Topics in the Digital Humanities; Digital Humanities Advancement Grants

Recent Research Grant and Contract Awards

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

PI: Hieu Nguyen (PI)

Department: Electrical and Computer Engineering

Grant/Contract Project Title: CAREER: Development of ALLnN Nanostructures for Advanced Ultraviolet Light-Emitters

Funding Agency: NSF

Duration: 07/01/20-06/30/25

PI: Gennady Gor (PI)

Department: Chemical Material Engineering

Grant/Contract Project Title: CAREER: Coupling Adsorption and Mechanics: Towards the Development of Smart Porous Materials

Funding Agency: NSF

Duration: 06/01/20-05/31/25

In the News...

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

Building Blocks of STEM Act: President Trump signed bipartisan legislation instructing the National Science Foundation "to improve the focus of research and development on early childhood education." [According to a summary](#), the Building Blocks of STEM Act also "specifies that NSF grants to increase the participation of underrepresented populations in STEM fields may be used for research into various subjects regarding female students in prekindergarten through elementary school, including the role of teachers and caregivers in encouraging or discouraging participation by such students in STEM activities, and the types of STEM activities that encourage greater participation by such students." Grants for research on computer science education may be used to develop various tools and models, including gender-inclusive enrichment and acquainting girls in prekindergarten through elementary school with careers in computer science. The measure was needed, lawmakers found, because "the majority of current research focuses on increasing STEM opportunities for middle school-aged children and older" and the disparity that leaves women underrepresented in the STEM workforce "extends down through all levels of education." As a component of improving participation of women in STEM fields, research funded by a grant under this subsection may include research on—

(A) the role of teacher training and professional development, including effective incentive structures to encourage teachers to participate in such training and professional development, in encouraging or discouraging female students in prekindergarten through elementary school from participating in STEM activities;

(B) the role of teachers in shaping perceptions of STEM in female students in prekindergarten through elementary school and discouraging such students from participating in STEM activities;

(C) the role of other facets of the learning environment on the willingness of female students in prekindergarten through elementary school to participate in STEM activities, including learning materials and textbooks, seating arrangements, use of media and technology, classroom culture, and composition of students during group work;

(D) the role of parents and other caregivers in encouraging or discouraging female students in prekindergarten through elementary school from participating in STEM activities;

(E) the types of STEM activities that encourage greater participation by female students in prekindergarten through elementary school;

(F) the role of mentorship and best practices in finding and utilizing mentors; and

(G) the role of informal and after-school STEM learning opportunities on the perception of and participation in STEM activities of female students in prekindergarten through elementary school.

Full text of the bill is posted on the website <https://www.govtrack.us/congress/bills/116/s737/text>

EXPORT CONTROLS ON Artificial Intelligence (AI) Software: The Department of Commerce's Bureau of Industry and Security (BIS) intends to "restrict the export of artificial intelligence (AI) software designed to automatically analyze geospatial satellite imagery," The Federal Register report "[Addition of Software Specially Designed To Automate the Analysis of Geospatial Imagery to the Export Control Classification Number 0Y521 Series](#)" states the addition of ECCN 0D521.

The Bureau of Industry and Security (BIS) amends the EAR to classify certain items subject to the EAR under the 0Y521 series and to impose a license requirement for the export and reexport of those items to all destinations, except Canada, for RS Column 1 reasons. Specifically, the items that will be subject to these new controls are described under ECCN 0D521 in the 0Y521 series table found in Supplement No. 5 to part 774 of the EAR, as follows:

ECCN 0D521 No. 1

Geospatial imagery “software” “specially designed” for training a Deep Convolutional Neural Network to automate the analysis of geospatial imagery and point clouds, and having all of the following:

1. Provides a graphical user interface that enables the user to identify objects (*e.g.*, vehicles, houses, etc.) from within geospatial imagery and point clouds in order to extract positive and negative samples of an object of interest;
2. Reduces pixel variation by performing scale, color, and rotational normalization on the positive samples;
3. Trains a Deep Convolutional Neural Network to detect the object of interest from the positive and negative samples; and
4. Identifies objects in geospatial imagery using the trained Deep Convolutional Neural Network by matching the rotational pattern from the positive samples with the rotational pattern of objects in the geospatial imagery.

Technical Note: A point cloud is a collection of data points defined by a given coordinate system. A point cloud is also known as a digital surface model.

Consistent with other 0Y521 series items, *license requirements* for the items described under the first entry for ECCN 0D521 of the 0Y521 series, appear in § 742.6(a)(7) of the EAR. The U.S. Government currently plans to *propose to an appropriate multilateral regime*, in this case the Wassenaar Arrangement, that multilateral controls be placed on these items.

National Quantum Information Science Research Centers: The Department of Energy plans to spend up to \$75 million over five years for research on "sustainable bioenergy crops tolerant of environmental stress and resilient to changing environmental conditions" that won't compete with food production. "Applications will be open to universities, industry, and nonprofit research institutions as the lead institution, with possible collaborators at DOE national laboratories and other federal agencies." DOE SC hereby announces its interest in receiving applications from multi-institutional, multidisciplinary teams (requesting support between \$10 and \$25 million per year) to establish National Quantum Information Science Research Centers referred to in the rest of this announcement as “Centers.” The goal of this FOA is to select applications that will accelerate the transformational advances in basic science and quantum-based technology needed to develop world-leading capabilities in Quantum Information Science (QIS), and in support of the National Quantum Initiative Act. See this and other [DOE funding opportunities](#) in the Grant Opportunities section below.

Efficient Energy Feedstock: The Advanced Research Projects Agency - Energy (ARPA-E) wants to "develop better monitoring technologies to quantify feedstock-related emissions for biofuels and promote new market incentives for improved efficiency in feedstock production and carbon management." The objective of the Systems for Monitoring and Analytics for Renewable Transportation Fuels from Agricultural Resources and Management (SMARTFARM) program is to bridge the data gap in the biofuel supply chain by funding the development of technologies that can replace national averages and emissions factors for feedstock-related emissions with field-level estimates. The value of such technologies will be evaluated by their ability to **reliably, accurately (i.e. low uncertainty), and cost-effectively quantify feedstock production lifecycle emissions (in g CO₂e/acre) at the field level (i.e. scalable to >80 acres)**. If successful, the technologies funded by this phase of the SMARTFARM program will catalyze new market incentives for efficiency in feedstock production and carbon management, reducing annual U.S. emissions by ~1%,^[1] and with substantially greater potential emissions reductions implications if expanded to other agricultural products beyond biofuels. The agency has \$20 million "to develop technologies to quantify feedstock-related emissions at the field level through its Systems for Monitoring and Analytics for Renewable Transportation Fuels from Agricultural Resources and Management

(SMARTFARM) program." The funding announcement is posted on the website <https://arpa-e-foa.energy.gov/Default.aspx?Search=SMARTFARM&SearchType=>

U.S. Congress approves \$1.4 trillion package of fiscal 2020 spending bills; With the appropriations, NASA would receive \$22.6 billion, while NSF and NIH would receive respectively \$8.3 billion and \$41.7 billion. Defense appropriations are at \$104 billion for research, development, test and evaluation with the Pentagon budget of \$738 billion for military activities. The \$1.4 trillion in spending for so-called "discretionary" programs, up from \$1.36 trillion last year, is separate from "mandatory" programs like Social Security retirement benefits, which are automatically funded.

HYPERSONICS AND UNMANNED SHIPS: An explanatory statement accompanying the defense appropriation says it provides \$100 million for the Joint Hypersonics Transition Office "to develop and implement an integrated science and technology roadmap for hypersonics and to establish a university consortium for hypersonics research and workforce development to support Department efforts to expedite testing, evaluation, and acquisition of hypersonic weapons systems." The bill also provides \$209 million for "two Large Unmanned Surface Vessels (LUSVs)."

SUPPORT FOR JASON STUDY: As part of an assessment of current risks and threats to research integrity, appropriators direct the White House Office of Science and Technology Policy "to also incorporate and apply the findings of the National Science Foundation JASON study to better protect the merit review system and for grantee institutions to maintain balance between openness and security of scientific research."

I-CORPS AND MSI's: NSF's Innovation Corps has become a durable institution. For FY 2020, Congress is providing \$5 million more than last year while urging the agency "to facilitate greater participation in the program from academic institutions in states that have not previously received awards." Within NSF, lawmakers also direct \$75 million to Advanced Technological Education; \$35 million to the Historically Black Colleges and Universities Undergraduate Program; \$47.5 million to the Louis Stokes Alliance for Minority Participation; \$15 million to Tribal Colleges and Universities; \$67 million to Robert Noyce Teacher Scholarships; and \$45 million to Hispanic-serving Institutions. They want to see "capacity building at institutions of higher education that typically do not receive high levels of NSF funding."

A SEVENTH FORCE? The newly enacted National Defense Authorization Act "asks the Defense Department to assess 'the potential costs, benefits, and value, if any, of establishing a cyber force as a separate uniformed service,'" CQ reports. A cyber force would become the seventh branch of the armed services. The Government Accountability Office says that the Pentagon's \$1.66 trillion worth of planned weaponry could be rendered useless by adversary hackers.

Climate Compels Collaboration: Ever since climate change became a concern for policymakers and laypeople alike, the focus of public debate has largely been on mitigation: limiting greenhouse gas emissions, capturing carbon, and transitioning to renewable energy. Those efforts must continue if we hope to keep the planet hospitable. But it is also time to acknowledge that—no matter what we do—some measure of climate change is here to stay. The phenomenon has already affected the U.S. economy, U.S. national security, and human health. Such costs will only grow over time. The United States must build resilience and overhaul key systems, including those governing infrastructure, the use of climate data, and finance. Academic disciplines and government agencies often remain isolated from each other, and neither is particularly good at working with the private sector, write the authors of "[Adapt or Perish](#)" in [Foreign Affairs](#). Resilience in the face of climate change "will require unprecedented levels of collaboration among different kinds of experts and across different kinds of organizations. For example, public health officials will have to partner with geospatial analysts and biologists to anticipate how climate

change may shift the geographic spread of mosquito-borne diseases, such as dengue and Zika. Corporate risk managers will need to work with engineers to figure out how to protect industrial facilities from new weather extremes. And military planners will have to learn from climate modelers how to secure bases and supply chains." Full report is posted on the website <https://www.foreignaffairs.com/articles/united-states/2019-12-10/adapt-or-perish>

Webinar and Events

Event: PAESMEM Applicant Webinars

Sponsor: NSF

When: January 14, 2019 7:00 PM

Website: https://www.nsf.gov/events/event_summ.jsp?cntn_id=299258&org=NSF

Brief Description: NSF is offering a webinar on January 14, 2020 for applicants to the Presidential Awards for Excellence in Science, Mathematics, and Engineering Mentoring (PAESMEM).

To Join the Webinar: Click on this link to register! <https://paesmem.net/webinar>

Event: S-STEM 2020 Webinars

Sponsor: NSF

When: January 21, 2019 1:00 PM; Various Repeats on January 22, 23, 27, 28, 29, 30

Website: https://www.nsf.gov/events/event_summ.jsp?cntn_id=299755&org=NSF

Brief Description: Submissions to the NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) Program are due by 5:00 p.m. local time Wednesday, 25 March 2020 in response to NSF solicitation 20-526. To answer questions that you may have about your potential submission, we have posted two narrated PowerPoint presentations: 1) Overview of Changes in the New Solicitation ([click here](#)), and 2) Overview of the S-STEM Program ([click here](#)). NSF S-STEM Program Directors will host a series of flipped "Office Hours" webinars in January. To prepare for the flipped "Office Hours" webinars, participants will be expected to have carefully read the solicitation ([click here](#)) and/or viewed the posted PowerPoint presentations (linked at the bottom of this page). S-STEM Program Officers will answer PI questions regarding the solicitation and program during the "Office Hours" webinars.

Additional information is available on the [NSF S-STEM program page](#).

To Join the Webinar: Click on this link to register! <https://paesmem.net/webinar>

Event: NSF Distinguished Lecture Series in Mathematical and Physical Sciences for 2019-20

Sponsor: NSF

When: Various; Please see below.

Website: https://www.nsf.gov/events/event_summ.jsp?cntn_id=299152&org=NSF

Brief Description: These lectures will be held at the National Science Foundation, 2415 Eisenhower Ave., Alexandria, VA 22314. Advance sign-up requests are required for preparation of visitor passes by emailing the contact below. Guidelines for visiting NSF are at <https://www.nsf.gov/about/visit/>

January 13, 2020 2:00 PM to January 13, 2020 3:00 PM

February 13, 2020 2:00 PM to February 13, 2020 3:00 PM

March 23, 2020 2:00 PM to March 23, 2020 3:00 PM

May 4, 2020 2:00 PM to May 4, 2020 3:00 PM

June 11, 2020 2:00 PM to June 11, 2020 3:00 PM

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

Event: NSF CAREER Engineering Program Proposal Development Workshop

Sponsor: NSF

Website: <https://nsfengcareerworkshop.ccnycunyu.edu/>

Brief Description: The NSF CAREER program is a Foundation-wide activity that offers the National Science Foundation's most prestigious awards in support of early-career faculty who have the potential to serve as academic role models in research and education and to lead advances in the mission of their department or organization. An NSF CAREER Proposal Workshop focused on engineering will be held March 31 – April 2, 2020 in Arlington, Virginia. The objective of the 2020 NSF ENG Directorate Workshop is to introduce junior faculty who are interested in submitting NSF CAREER proposals to the Directorate for Engineering. The workshop aims to provide individuals with proposal development insights and a forum in which they can interact with NSF program directors and recent NSF CAREER awardees.

Workshop participation will be by invitation, based on applications, and limited to 300 participants who will be selected from the pool of applicants based on: a) applicability of the proposed research to the Directorate for Engineering, b) timeliness and completeness of the application, and c) preference given to those who have not previously attended an NSF Engineering CAREER workshop. Please review the application page for further information.

Cost: NSF has provided partial funding for the workshop. Those individuals selected to participate will be required to submit a workshop registration fee of \$500. Workshop attendees are responsible for their travel, lodging, and expenses. There will be a limited number of \$1,000 travel grants available to participants to help defray the cost of travel.

Application Deadline: January 6, 2020

Registration Deadline: February 14, 2020

Agenda: 2020 NSF ENG CAREER Proposal Writing Workshop

Crystal Gateway Marriott, 1700 Richmond Hwy, Arlington, VA 22202

March 31 – April 2, 2020

Tuesday: Networking Reception, 5PM – 7PM

Wednesday: Workshop Day 1, 7:00AM – 5PM

Thursday: Workshop Day 2, 7:00AM – 2PM

To Apply and Register: Submit your application at

<https://nsfengcareerworkshop.ccnycunyu.edu/application-will-be-available-on-october-28-2019/>

Event: Public Workshop - Evolving Role of Artificial Intelligence in Radiological Imaging

Sponsor: FDA

When: February 25-26, 2020; 8.00 AM – 5.30 PM

Website: [https://www.fda.gov/medical-devices/workshops-conferences-medical-devices/public-workshop-evolving-role-artificial-intelligence-radiological-imaging-02252020-](https://www.fda.gov/medical-devices/workshops-conferences-medical-devices/public-workshop-evolving-role-artificial-intelligence-radiological-imaging-02252020-02262020?utm_campaign=2019-12-03%20CDRH%20New&utm_medium=email&utm_source=Eloqua)

[02262020?utm_campaign=2019-12-03%20CDRH%20New&utm_medium=email&utm_source=Eloqua](https://www.fda.gov/medical-devices/workshops-conferences-medical-devices/public-workshop-evolving-role-artificial-intelligence-radiological-imaging-02252020-02262020?utm_campaign=2019-12-03%20CDRH%20New&utm_medium=email&utm_source=Eloqua)

Brief Description: The Food and Drug Administration (FDA) is announcing the following public workshop entitled "Evolving Role of Artificial Intelligence in Radiological Imaging." The intent of this public workshop is to discuss emerging applications of Artificial Intelligence (AI) in radiological imaging including AI devices intended to automate the diagnostic radiology workflow as well as guided image acquisition. The purpose of the workshop is to work with interested stakeholders to identify the benefits and risks associated with use of AI in radiological imaging. We also plan to discuss best practices for the validation of AI-automated radiological imaging software and image acquisition devices. Validation of device performance with respect to the intended use is critical to assess safety and effectiveness.

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

Grant Opportunities

National Science Foundation

Grant Program: Spectrum and Wireless Innovation enabled by Future Technologies (SWIFT)

Agency: National Science Foundation NSF 20-537

RFP Website: <https://www.nsf.gov/pubs/2020/nsf20537/nsf20537.htm>

Brief Description: The National Science Foundation's Directorates for Engineering (ENG), Computer and Information Science and Engineering (CISE), Mathematical and Physical Sciences (MPS), and Geosciences (GEO) are coordinating efforts to identify new concepts and ideas on Spectrum and Wireless Innovation enabled by Future Technologies (SWIFT). A key aspect of this new solicitation is its focus on effective spectrum utilization and/or coexistence techniques, especially with passive uses, which have received less attention from researchers. Coexistence is when two or more applications use the same frequency band at the same time and/or at the same location, yet do not adversely affect one another. Coexistence is especially difficult when at least one of the spectrum users is passive, i.e., not transmitting any radio frequency (RF) energy. Examples of coexisting systems may include passive and active systems (e.g., radio astronomy and 5G wireless communication systems) or two active systems (e.g., weather radar and Wi-Fi). Breakthrough innovations are sought on both the wireless communication hardware and the algorithmic/protocol fronts through synergistic teamwork. The goal of these research projects may be the creation of new technology or significant enhancements to existing wireless infrastructure, with an aim to benefit society by improving spectrum utilization, beyond mere spectrum efficiency. The SWIFT program seeks to fund collaborative team research that transcends the traditional boundaries of individual disciplines.

Awards: Standard grants.

Approximately 6 awards of up to \$500,000 each for 3 years for SMALL team efforts.

Approximately 6 awards of up to \$1,500,000 each for 3 years for LARGE team efforts.

Anticipated Funding Amount: \$12,000,000

Letter of Intent: Not Required

Proposal Submission Deadline: April 03, 2020

Contacts: Jenshan Lin, ENG/ECCS, telephone: (703) 292-8339, email: jenlin@nsf.gov

- Monisha Ghosh, CISE/CNS, telephone: (703) 292-8950, email: mghosh@nsf.gov
- Alexander Sprintson, CISE/CNS, telephone: (703) 292-8950, email: asprints@nsf.gov

Grant Program: Division of Integrative Organismal Systems Core Programs

Agency: National Science Foundation NSF 20-536

RFP Website: <https://www.nsf.gov/pubs/2020/nsf20536/nsf20536.htm>

Brief Description: The Division of Integrative Organismal Systems (IOS) **Core Programs Track** supports research aimed at understanding why organisms are structured the way they are and function as they do. Proposals are welcomed in all of the core scientific program areas supported by the Division of Integrative Organismal Systems (IOS). Areas of inquiry include, but are not limited to, developmental biology and the evolution of developmental processes, nervous system development, structure, modification, function, and evolution; biomechanics and functional morphology, physiological processes, symbioses and microbial interactions, interactions of organisms with biotic and abiotic environments, plant and animal genomics, and animal behavior. Proposals should focus on organisms as a fundamental unit of biological organization. Principal Investigators (PIs) are encouraged to apply systems approaches that will lead to conceptual and theoretical insights and predictions about emergent organismal properties.

The Rules of Life Track supports integrative proposals that span the subcellular and cellular scales normally funded by MCB to the organ, tissue, organismal, and group scale typically funded by IOS, to population, species, community and ecosystem scales typically funded by DEB. Rules of Life proposals may also include enabling infrastructure through joint submission with DBI. Discovery of fundamental principles and enabling infrastructure will advance understanding and further predict how key properties of living systems emerge from the interaction of genomes, phenotypes, and developmental, social and environmental context across space and time. This track provides opportunities to advance understanding of the Rules of Life by new mechanisms for review and funding of proposals that span two or more divisions in the Biological Sciences Directorate.

Awards: Standard grants. Anticipated Funding Amount: \$60,000,000

Letter of Intent: Not Required

Proposal Submission Deadline: Proposals Accepted Anytime

Contacts: Behavioral Systems Program Directors, telephone: (703) 292-8423, email: IOSBSC@nsf.gov

- Developmental Systems Program Directors, telephone: (703) 292-8417, email: IOSDSC@nsf.gov
- Neural Systems Program Directors, telephone: (703) 292-8421, email: IOSNSC@nsf.gov

Grant Program: International Research and education Network Connections (IRNC)

Agency: National Science Foundation NSF 20-535

RFP Website: <https://www.nsf.gov/pubs/2020/nsf20535/nsf20535.htm>

Brief Description: The International Research and education Network Connections (IRNC) Base program supports high-performance network connectivity required by international science and engineering research and education collaborations involving the NSF research community. High-performance network connections and infrastructure funded by this program are intended to support science and engineering research and education applications, and preference will be given to solutions that provide the best economy of scale and demonstrate the ability to support the largest communities of interest with the broadest services. Funded projects will assist the U.S. research and education community by enabling state-of-the-art international network services and access to increased collaboration and data services. NSF expects to make 3 to 10 awards in production R&E network infrastructure; 1 to 3 awards in international testbeds; and 1 award in Engagement.

Awards: Standard and continuing grants. Anticipated Funding Amount: \$20,000,000 to \$50,000,000

The estimated number of awards is 5-14 in total: 3-10 IRNC: Core awards; 1-3 IRNC: Testbed awards, and 1 IRNC: ENGage award.

Because of the nature and geographic extent of the efforts involved, interested parties are encouraged to form consortia of organizations that can work together to provide the needed services. Consortia may consist of any number of U.S. and foreign, profit and non-profit entities. The award(s) resulting from responses to this solicitation will be made to U.S. organizations as cooperative agreements or standard or continuing grants. Any award will be for a maximum of five years.

Each program area will support awards pursuant to the following budget and duration:

- IRNC: Core awards will be supported at up to \$1,400,000 per year for up to 5 years;
- IRNC: Testbed awards will be supported at up to \$1,000,000 per year for up to 3 years; and,
- IRNC: ENGage awards will be supported at up to \$1,000,000 per year for up to 5 years.

Letter of Intent: Not Required

Proposal Submission Deadline: April 01, 2020

Contacts: Kevin L. Thompson, telephone: (703) 292-4220, email: kthompso@nsf.gov

Grant Program: Principles and Practice of Scalable Systems (PPoSS)

Agency: National Science Foundation NSF 20-534

RFP Website: <https://www.nsf.gov/pubs/2020/nsf20534/nsf20534.htm>

Brief Description: A key focus of the design of modern computing systems is performance and scalability, particularly in light of the limits of Moore's Law and Dennard scaling. To this end, systems are increasingly being implemented by composing heterogeneous computing components and continually changing memory systems as novel, performant hardware surfaces. Applications fueled by rapid strides in machine learning, data analysis, and extreme-scale simulation are becoming more domain-specific and highly distributed. In this scenario, traditional boundaries between hardware-oriented and software-oriented disciplines increasingly are blurred.

Achieving scalability of systems and applications will therefore require coordinated progress in multiple disciplines such as computer architecture, high-performance computing (HPC), programming languages and compilers, security and privacy, systems, theory, and algorithms. Cross-cutting concerns such as performance (including, but not limited to, time, space, and communication resource usage and energy efficiency), correctness and accuracy (including, but not limited to, emerging techniques for program analysis, testing, debugging, probabilistic reasoning and inference, and verification), security and privacy, robustness and reliability, domain-specific design, and heterogeneity must be taken into account from the outset in all aspects of systems and application design and implementation.

The aim of the Principles and Practice of Scalable Systems (PPoSS) program is to support a community of researchers who will work symbiotically across the multiple disciplines above to perform basic research on scalability of modern applications, systems, and toolchains. The intent is that these efforts will foster the development of principles that lead to rigorous and reproducible artifacts for the design and implementation of large-scale systems and applications across the full hardware/software stack. These principles and methodologies should simultaneously provide guarantees on correctness and accuracy, robustness, and security and privacy of systems, applications, and toolchains. Importantly, as described below, **PPoSS specifically seeks to fund projects that span the entire hardware/software stack** and will lay the groundwork for sustainable approaches for engineering highly performant, scalable, and robust computing applications.

Awards: Standard grants.

Planning Grants: Approximately 15 awards will be made in FY 2020, 8 awards in FY 2021, and 4 awards in FY 2022, pending availability of funds and quality of proposals received.

LARGE Grants: Approximately 4 awards will be made each year in FY 2021, FY 2022, FY 2023, and FY 2024, pending availability of funds and quality of proposals received.

Anticipated Funding Amount: \$86,750,000

Planning Grants: Up to \$250,000 per award with duration up to 1 year.

LARGE Grants: Up to \$1,000,000 per year with duration up to 5 years

Letter of Intent: Not Required

Proposal Submission Deadline: March 30, 2020: Planning grants only

January 25, 2021 for Planning grants and LARGE grants

Contacts: Funda Ergun, Program Director, CISE/CCF, telephone: (703) 292-2216, email: fergun@nsf.gov

- Anindya Banerjee, Program Director, CISE/CCF, telephone: (703) 292-7885, email: abanerje@nsf.gov
- Vipin Chaudhary, Program Director, CISE/OAC, telephone: (703) 292-2254, email: vipchaud@nsf.gov

Grant Program: Enabling Discovery through GENomic Tools (EDGE)

Agency: National Science Foundation NSF 20-532

RFP Website: <https://www.nsf.gov/pubs/2020/nsf20532/nsf20532.htm>

Brief Description: The Enabling Discovery through GENomic Tools (EDGE) program supports genomic research that addresses the mechanistic basis of complex traits in diverse organisms within the context (environmental, developmental, social, and/or genomic) in which they function. The EDGE program also continues to support the development of innovative tools, technologies, resources, and infrastructure that advance biological research focused on the identification of the causal mechanisms connecting genes and phenotypes. EDGE is designed to provide support for (1) the development of tools, approaches, and infrastructure aimed at testing cause and effect hypotheses between gene function and phenotypes in diverse plants, animals, microbes, viruses, or fungi for which these methods are presently unavailable, and (2) hypothesis-driven research that tests cause and effect relations between genotype(s) and phenotypes in non-model plants, animals, microbes, viruses, or fungi.

Awards: Standard grants. Anticipated Funding Amount: \$10,000,000

Letter of Intent: Not Required

Proposal Submission Deadline: Proposals Accepted Anytime

Contacts: Edda (Floh) Thiels, telephone: (703) 292-8167, email: ethiels@nsf.gov

- Douglas K. (Patrick) Abbot, telephone: (703) 292-7820, email: dabbot@nsf.gov
 - Ford Ballantyne, telephone: (703) 292-8037, email: fballant@nsf.gov
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Grant Program: Algorithms for Threat Detection (ATD)

Agency: National Science Foundation NSF 20-531

RFP Website: <https://www.nsf.gov/pubs/2020/nsf20531/nsf20531.htm>

Brief Description: The Algorithms for Threat Detection (ATD) program will support research projects to develop the next generation of mathematical and statistical algorithms for analysis of large spatiotemporal datasets with application to quantitative models of human dynamics. The program is a partnership between the Division of Mathematical Sciences (DMS) at the National Science Foundation (NSF) and the National Geospatial Intelligence Agency (NGA).

Awards: Standard grants. Anticipated Funding Amount: \$3,000,000

Letter of Intent: Not Required

Proposal Submission Deadline: March 18, 2020

Contacts: Leland M. Jameson, Program Director, NSF MPS/DMS, telephone: (703) 292-4883, email: ljameson@nsf.gov

- Janet P. Striuli, Program Director, NSF MPS/DMS, teleph: (703) 292-2858, email: jstriuli@nsf.gov
 - John Greer, Program Director, National Geospatial Intelligence Agency, NGA, telephone: (571) 557-2944, email: John.B.Greer@nga.mil
-

Grant Program: Competition for the Management of Operations and Maintenance of the National Ecological Observatory Network (NEON)

Agency: National Science Foundation NSF 20-530

RFP Website: <https://www.nsf.gov/pubs/2020/nsf20530/nsf20530.htm>

Brief Description: NSF solicits proposals to manage the operations and maintenance of the National Ecological Observatory Network (NEON), an NSF-funded major facility project. NEON comprises terrestrial, aquatic, atmospheric, and remote sensing measurement infrastructure and cyberinfrastructure that deliver standardized, calibrated data to the scientific community through a single, openly accessible data portal. NEON infrastructure is geographically distributed across the United States, including Alaska,

Hawaii and Puerto Rico, and will generate data for ecological research over a 30-year period. NEON is designed to enable the research community to ask and address their own questions on a regional to continental scale around the environmental challenges identified as relevant to understanding the effects of climate change, land-use change and invasive species patterns on the biosphere. The NSF NEON program, which is part of the Centers and Cooperative Agreements Cluster in the Division of Biological Infrastructure, manages the NEON award in collaboration with the NSF Large Facilities Office and the NSF Division of Acquisition and Cooperative Support.

Awards: Cooperative Agreement. Single award. Anticipated Funding Amount: \$65,000,000

Letter of Intent: Submission of Letters of Intent is required. Due by February 21, 2020

Limit on Number of Proposals per Organization: 1

An organization may only submit 1 proposal as the lead. There is no limit on the number of proposals on which an organization can be included as a subawardee.

Proposal Submission Deadline: June 19, 2020 (due by 5 p.m. submitter's local time):

Contacts: Roland Roberts, Cognizant Program Officer, telephone: (703) 292-7884, email: neon-bot@nsf.gov

- Montona Futrell-Griggs, Project Manager, telephone: (703) 292-7162, email: neon-bot@nsf.gov

Grant Program: NSF Innovation Corps Hubs Program

Agency: National Science Foundation NSF 20-529

RFP Website: https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505760

Brief Description: The National Science Foundation (NSF) seeks to further develop and nurture a national innovation ecosystem that guides the output of scientific discoveries closer to the development of technologies, products, and services that benefit society. The goal of the NSF Innovation Corps (I-Corps) Program, created in 2011 by NSF, has been and will continue to be to reduce the time and risk associated with translating promising ideas and technologies from the laboratory to the marketplace. The I-Corps Program utilizes experiential learning of customer and industry discovery, coupled with first-hand investigation of industrial processes, to quickly assess the translational potential of inventions. The I-Corps Program is designed to support the commercialization of so-called "deep technologies," or those revolving around fundamental discoveries in science and engineering. The I-Corps program addresses the skill and knowledge gap associated with the transformation of basic research into deep technology ventures (DTV's). In the program's initial phase, I-Corps Nodes and Sites were funded separately to serve as the backbone of the National Innovation Network (NIN). Previous solicitations for NSF I-Corps Nodes and NSF I-Corps Sites have now been archived. This new solicitation for I-Corps Hubs has been informed by feedback received from the community and lessons learned over the first eight years of the program.

Awards: Standard grants. Anticipated Funding Amount: \$12,000,000

Letter of Intent: Not Required

Proposal Submission Deadline: April 14, 2020

Contacts: Andre Marshall awmarsha@nsf.gov (703) 292-2257

Pamular McCauley pamccaul@nsf.gov (703) 292-4505

Ruth Shuman rshuman@nsf.gov (703) 292-2160

Grant Program: Small Business Technology Transfer Program Phase I (STTR)

Agency: National Science Foundation NSF 20-528

RFP Website: <https://www.nsf.gov/pubs/2020/nsf20528/nsf20528.htm>

Brief Description: The STTR program is intended to support scientific excellence and technological innovation through the investment of federal research funds to build a strong national economy by

stimulating technological innovation in the private sector; strengthening the role of small business in meeting federal research and development needs; increasing the commercial application of federally supported research results; and fostering and encouraging participation by socially and economically disadvantaged and women-owned small businesses.

The STTR program at NSF solicits proposals from the small business sector consistent with NSF's mission to promote the progress of science; to advance the national health, prosperity, and welfare; and to secure the national defense.

Because the program has no topical or procurement focus, the NSF offers very broad solicitation topics that are intended to encourage as many eligible science- and technology-based small businesses as possible to compete for funding. The topics are detailed on the program [website](#). In many cases, the program is also open to proposals focusing on technical and market areas not explicitly noted in the aforementioned topics.

Awards: Standard grants. Anticipated Funding Amount: \$17,000,000

Letter of Intent: Not Required

Proposal Submission Deadline: December 18, 2019 - March 05, 2020 The NSF SBIR/STTR Program opened **four submission windows**, as opposed to specific deadlines, that allow small businesses the flexibility to submit a full proposal at any time within a window.

Contacts: Henry Ahn, Biomedical (BM) Technologies and Medical Devices (MD), telephone: (703) 292-7069, email: hahn@nsf.gov

- Peter Atherton, Information Technologies (IT), Artificial Intelligence (AI), and Quantum Information Technologies (QT), telephone: (703) 292-8772, email: patherto@nsf.gov
- Anna Brady-Estevez, Chemical Technologies (CT), Energy Technologies (EN), and Distributed Ledger (DL), telephone: (703) 292-7077, email: abrady@nsf.gov

Grant Program: Small Business Innovation Research Program Phase I (SBIR)

Agency: National Science Foundation NSF-20-527

RFP Website: <https://www.nsf.gov/pubs/2020/nsf20527/nsf20527.htm>

Brief Description: The SBIR program is intended to support scientific excellence and technological innovation through the investment of federal research funds to build a strong national economy by stimulating technological innovation in the private sector; strengthening the role of small business in meeting federal research and development needs; increasing the commercial application of federally supported research results; and fostering and encouraging participation by socially and economically disadvantaged and women-owned small businesses.

The SBIR program at NSF solicits proposals from the small business sector consistent with NSF's mission to promote the progress of science; to advance the national health, prosperity, and welfare; and to secure the national defense.

Because the program has no topical or procurement focus, the NSF offers very broad solicitation topics that are intended to encourage as many eligible science- and technology-based small businesses as possible to compete for funding. The topics are detailed on the program [website](#). In many cases, the program is also open to proposals focusing on technical and market areas not explicitly noted in the aforementioned topics.

Awards: Standard grants. Anticipated Funding Amount: \$75,000,000

Letter of Intent: Not Required

Proposal Submission Deadline: December 18, 2019 - March 05, 2020 The NSF SBIR/STTR Program opened **four submission windows**, as opposed to specific deadlines, that allow small businesses the flexibility to submit a full proposal at any time within a window.

Contacts: Henry Ahn, Biomedical (BM) Technologies and Medical Devices (MD), telephone: (703) 292-7069, email: hahn@nsf.gov

- Peter Atherton, Information Technologies (IT), Artificial Intelligence (AI), and Quantum Information Technologies (QT), telephone: (703) 292-8772, email: patherto@nsf.gov
 - Anna Brady-Estevez, Chemical Technologies (CT), Energy Technologies (EN), and Distributed Ledger (DL), telephone: (703) 292-7077, email: abrady@nsf.gov
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Grant Program: NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM)

Agency: National Science Foundation NSF 20-526

RFP Website: <https://www.nsf.gov/pubs/2020/nsf20526/nsf20526.htm>

Brief Description: A well-educated science, technology, engineering, and mathematics (STEM) workforce is a significant contributor to maintaining the competitiveness of the U.S. in the global economy. The National Science Foundation (NSF) Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) program addresses the need for a high quality STEM workforce in STEM disciplines supported by the program and for the increased success of low-income academically talented students with demonstrated financial need who are pursuing associate, baccalaureate, or graduate degrees in science, technology, engineering, and mathematics (STEM).

Recognizing that financial aid alone cannot increase retention and graduation in STEM, the program provides awards to Institutions of Higher Education (IHEs) to fund scholarships and to advance the adaptation, implementation, and study of effective evidence-based curricular and co-curricular activities that support recruitment, retention, transfer (if appropriate), student success, academic/career pathways, and graduation in STEM. The S-STEM program encourages collaborations among different types of participating groups, including but not limited to partnerships among different types of institutions; collaborations of STEM faculty and institutional, educational, and social science researchers; and partnerships among institutions of higher education and business, industry, local community organizations, national labs, or other federal or state government organizations, if appropriate.

The program seeks to 1) increase the number of low-income academically talented students with demonstrated financial need obtaining degrees in S-STEM eligible disciplines and entering the workforce or graduate programs in STEM; 2) improve the education of future scientists, engineers, and technicians, with a focus on low-income academically talented students with demonstrated financial need; and 3) generate knowledge to advance understanding of how interventions or evidence-based curricular and co-curricular activities affect the success, retention, transfer, academic/career pathways, and graduation of low-income students in STEM.

Scholars must be low-income, academically talented students with unmet financial need who are enrolled in an associate, baccalaureate or graduate degree program, with a major in an S-STEM eligible discipline.

S-STEM Eligible Degree Programs:

Associate of Arts, Associate of Science, and Associate of Applied Science

Bachelor of Arts, Bachelor of Science, and Bachelor of Applied Science

Master of Arts and Master of Science

Doctoral

S-STEM Eligible Disciplines:

Biological sciences (except medicine and other clinical fields)

Physical sciences (including physics, chemistry, astronomy, and materials science)

Mathematical sciences

Computer and information sciences

Geosciences

Engineering

Technology fields associated with the disciplines above (e.g. biotechnology, chemical technology, engineering technology, information technology)

Awards: Standard grants. Anticipated Funding Amount: \$70,000,000 to \$95,000,000

\$70,000,000 to \$95,000,000 annually, for new and continuing awards. The program supports three types of projects. Awards for Track 1 (Institutional Capacity Building) projects may not exceed \$650,000. Awards for Track 2 (Design and Development: Single Institution) projects may not exceed \$1.0 million. Awards for Track 3 (Design and Development: Multi-Institutional Consortia) projects may not exceed \$5.0 million. In all cases, the totals are inclusive of direct and indirect costs.

Limit on Number of Proposals per Organization: An Institution may submit one proposal (either as a single institution or as subawardee or a member of a Collaborative Research project) from each constituent school or college that awards degrees in an S-STEM eligible discipline.

Letter of Intent: Not Required

Proposal Submission Deadline: March 25, 2020

Contacts: Keith Sverdrup, telephone: (703) 292-4671, email: ksverdru@nsf.gov

- Andrea Johnson, telephone: (703) 292-5164, email: andjohns@nsf.gov
- Sami Rollins, telephone: (703) 292-7133, email: srollins@nsf.gov

Grant Program: Faculty Early Career Development Program (CAREER): Includes the description of NSF Presidential Early Career Awards for Scientists and Engineers (PECASE)

Agency: National Science Foundation NSF 20-525

RFP Website: <https://www.nsf.gov/pubs/2020/nsf20525/nsf20525.htm>

Brief Description: *CAREER:* The Faculty Early Career Development (CAREER) Program is a Foundation-wide activity that offers the National Science Foundation's most prestigious awards in support of early-career faculty who have the potential to serve as academic role models in research and education and to lead advances in the mission of their department or organization. Activities pursued by early-career faculty should build a firm foundation for a lifetime of leadership in integrating education and research. NSF encourages submission of CAREER proposals from early-career faculty at all CAREER-eligible organizations and especially encourages women, members of underrepresented minority groups, and persons with disabilities to apply.

PECASE: Each year NSF selects nominees for the Presidential Early Career Awards for Scientists and Engineers (PECASE) from among the most meritorious recent CAREER awardees. Selection for this award is based on two important criteria: 1) innovative research at the frontiers of science and technology that is relevant to the mission of NSF, and 2) community service demonstrated through scientific leadership, education, or community outreach. These awards foster innovative developments in science and technology, increase awareness of careers in science and engineering, give recognition to the scientific missions of the participating agencies, enhance connections between fundamental research and national goals, and highlight the importance of science and technology for the Nation's future. Individuals cannot apply for PECASE. These awards are initiated by the participating federal agencies. At NSF, up to twenty nominees for this award are selected each year from among the PECASE-eligible CAREER awardees most likely to become the leaders of academic research and education in the twenty-first century. The White House Office of Science and Technology Policy makes the final selection and announcement of the awardees.

Awards: Standard grants. Anticipated Funding Amount: \$255,000,000

Letter of Intent: Not Required

Proposal Submission Deadline: July 27, 2020

Contacts: Division CAREER contacts listed on the CAREER web page

at: <https://www.nsf.gov/crssprgm/career/contacts.jsp>

- See Contacts listing, NSF, telephone: (703) 292-5111, email: nfo@nsf.gov
-

Grant Program: National Robotics Initiative 2.0: Ubiquitous Collaborative Robots (NRI-2.0)

Agency: National Science Foundation NSF 20-522

RFP Website: <https://www.nsf.gov/pubs/2020/nsf20522/nsf20522.htm>

Brief Description: The NRI-2.0 program builds upon the original National Robotics Initiative (NRI) program to support fundamental research in the United States that will accelerate the development and use of collaborative robots (co-robots). A co-robot is a robot whose main purpose is to work with people or other robots to accomplish a goal. An ideal co-robot is an adaptable partner, not limited to a narrow set of specified interactions or functions, but able to significantly enhance team performance despite changes in its role, its teammates, or the team's collective goals. The focus of the NRI-2.0 program is on **ubiquity**, which in this context means seamless integration of co-robots to assist humans in every aspect of life.

The program supports four main research themes that are envisioned to advance the goal of ubiquitous co-robots: **scalability**, **customizability**, **lowering barriers to entry**, and **societal impact**, including human safety. Topics addressing **scalability** include how robots can collaborate effectively with orders of magnitude more humans or other robots than is handled by the current state of the art; how robots can perceive, plan, act, and learn in uncertain, real-world environments, especially in a distributed fashion; and how to facilitate large-scale, safe, robust and reliable operation of robots in complex environments. **Customizability** includes how to enable co-robots to adapt to specific different tasks, environments, or people, with minimal modification to hardware and software; how robots can personalize their interactions with people; and how robots can communicate naturally with humans, both verbally and non-verbally. Topics in **lowering barriers to entry** should focus on lowering the barriers for conducting fundamental robotics *research* and research on integrated robotics application. This may include development of open-source co-robot hardware and software, as well as widely-accessible testbeds. Outreach or using robots in educational programs do not, by themselves, lower the barriers to entry for robotics research. Topics in **societal impact** include fundamental research to establish and infuse robotics into educational curricula, advance the robotics workforce through education pathways, and explore the social, economic, ethical, security, and legal implications of our future with ubiquitous collaborative robots.

Awards: Standard grants. Anticipated Funding Amount: \$22,000,000 to \$32,000,000

Letter of Intent: Not Required

Proposal Submission Deadline: February 12, 2020 - February 26, 2020

Contacts: David Miller, CISE/IIS, telephone: (703) 292-4914, email: damiller@nsf.gov

- Scott Acton, CISE/CCF, telephone: (703) 292-2124, email: sacton@nsf.gov
 - Radhakisan Baheti, ENG/ECCS, telephone: (703) 292-8339, email: rbaheti@nsf.gov
-

Grant Program: EHR Core Research (ECR): Building Capacity in STEM Education Research (ECR: BCSER)

Agency: National Science Foundation NSF 20-521

RFP Website: <https://www.nsf.gov/pubs/2020/nsf20521/nsf20521.htm>

Brief Description: ECR's Building Capacity for STEM Education Research (ECR: BCSER) solicitation supports projects that build individuals' capacity to carry out high quality STEM education research that will enhance the nation's STEM education enterprise and broaden the pool of researchers that can conduct

fundamental research in STEM learning and learning environments, broadening participation in STEM fields, and STEM workforce development.

Specifically, ECR: BCSER supports activities that enable early and mid-career researchers to acquire the requisite expertise and skills to conduct rigorous fundamental research in STEM education. ECR: BCSER seeks to fund research career development activities on topics that are relevant to qualitative and quantitative research methods and design, including the collection and analysis of new qualitative or quantitative data, secondary analyses using extant datasets, or meta-analyses.

This career development may be accomplished through investigator-initiated projects or through professional development institutes that enable researchers to integrate methodological strategies with theoretical and practical substantive issues in STEM education. Early and mid-career faculty new to STEM education research, particularly underrepresented minority faculty and faculty at minority-serving and two-year institutions, are encouraged to submit proposals.

ECR: BCSER especially welcomes proposals that pair well with the efforts of NSF INCLUDES (https://www.nsf.gov/news/special_reports/nsfincludes/index.jsp) to develop STEM talent from all sectors and groups in our society. Proposers are encouraged to identify topics that support the thrust of NSF INCLUDES projects.

Awards: Standard grants. Anticipated Funding Amount: \$12,000,000

NSF expects to make 26 standard or continuing grant awards. The ECR: BCSER competition anticipates having approximately \$12,000,000 for new awards in FY 2020, subject to availability of funds, as follows: Individual Investigator Development in STEM Education Research: Up to 16 awards. The maximum award amount is \$350,000 for two years.

Institutes in Research Methods: Up to five awards. The maximum award amount for is \$1,000,000 for three years.

The typical award amount for Conferences is \$25,000 to \$100,000.

Letter of Intent: Not Required

Proposal Submission Deadline: February 28, 2020

Contacts: Please direct inquiries to:, telephone: (703) 292-8112, email: ECRBCSER@nsf.gov

Grant Program: Dear Colleague Letter: NSF/NSFC Joint Research on Environmental Sustainability Challenges

Agency: National Science Foundation NSF 20-019

RFP Website: <https://www.nsf.gov/pubs/2020/nsf20019/nsf20019.pdf>

Brief Description: The NSF Engineering Directorate (ENG) and the National Natural Science Foundation of China (NSFC) Department of Engineering and Material Sciences (DEMS) and Department of Geosciences are partnering to encourage joint research by U.S. - China teams collaborating on fundamental research that addresses critical environmental sustainability challenges.

Among nations, the U.S. and China have the two largest economies on Earth and also have important engineering, technology, business and trade relationships with each other. Both nations face significant environmental sustainability challenges, for example in the foodenergy-water (FEW) nexus, urban sustainability, global change, and manufacturing. Fundamental research is needed to provide the foundational knowledge for addressing these challenges. This Dear Colleague Letter is for research proposals from joint U.S. - China teams in the environmental sustainability themes of: *"Innovations at the Nexus of Food, Energy, and Water Systems (INFEWS: U.S.-China)"*

1. quantitative and computational modeling of a FEW system
2. innovative human and technological solutions to critical FEW systems problems.

Every proposal must include the participation of researchers from at least one U.S. organization and at least one institution in China. Proposals that do not comply with this requirement will be returned

without review. The proposal submitted to NSF must conform to NSF proposal requirements as specified in NSF's posted Proposal and Award Policies and Procedures Guide (NSF 19-1), and the matching proposal submitted to NSFC must conform to requirements posted by NSFC. NSF will fund the U.S. researchers up to a total of \$500,000 for 4 years for each recommended award, while NSFC will fund the China 1 researchers up to a total of 3 million yuan for 4 years for each recommended award. In total, no more than 6 joint NSF-NSFC project grants are expected to be funded. NSF research funding is pending the availability of funds. Each proposal must include a management plan that clearly specifies the role of team researchers from both the U.S. and China, and the mechanisms through which close collaboration will be assured. The management plan is not to exceed 3 pages and is to be included in the supplementary document file of the electronic submission.

Cyberinfrastructure proposals are outside the scope of this Dear Colleague Letter.

Awards: U.S.-based researchers, through their U.S. organizations, may submit unsolicited proposals to collaborate with China-based researchers on the INFEWS topic described above to the ENG/CBET Environmental Sustainability (7643) program. Please note that, even though the Environmental Sustainability program has no submission deadline, proposals submitted for consideration under this DCL must be received by 5:00 pm local submitter's time on February 26, 2020.

More information on submittal procedures is posted at:
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505695&org=CBET&from=home.

Each U.S. - China team is responsible for ensuring that their counterpart submits a matching proposal by the required deadline. Each submitted proposal must include a letter from the collaborator. For NSF proposals, the collaborator letter is to be included in the supplementary documents file of the electronic submission, along with the management plan described earlier.

Letter of Intent: Not Required

Proposal Submission Deadline: February 26, 2020

Contacts: Questions concerning this opportunity may be emailed to the CBET Environmental Sustainability program director, Bruce Hamilton (bhamilto@nsf.gov) or the CBET Associate Environmental Sustainability program director, Brandi Schottel (bschotte@nsf.gov)

National Institutes of Health

Grant Program: NIBIB Trailblazer Award for New and Early Stage Investigators (R21 Clinical Trial Optional)

Agency: National Institutes of Health PAR-20-084

RFP Website: <https://grants.nih.gov/grants/guide/pa-files/PAR-20-084.html>

Brief Description: A Trailblazer project may be exploratory, developmental, proof of concept or have high risk-high impact goals. Importantly, the proposed research for this FOA may be technology design-directed and may or may not be hypothesis-driven. In the context of this FOA, innovation encompasses approaches to address well-defined, unmet biomedical research needs through the development of new methods, ideas, or technologies; early steps along the path toward delivery of a new capability or method; and the integration of existing components in a previously unproven format. High-impact projects should transform our understanding or practice by applying an innovative approach to an important biomedical challenge. For projects supported by a Trailblazer Award, successful results should provide a solid foundation for further research under other funding mechanisms, such as the R01. Applicants will be considered ineligible for this funding opportunity if they have submitted an R01, R15 or any other R21 application, with NIBIB as the primary IC within the same review cycle. An awardee may not hold concurrent Trailblazer awards. All areas of research germane to the mission of the NIBIB are appropriate for the Trailblazer FOA (<https://www.nibib.nih.gov/research-funding>).

Trailblazer approaches are expected to differ substantially from current thinking or practice, therefore, extensive preliminary data demonstrating feasibility is an indication that the project is beyond the scope of this FOA. Reviewers' determinations of merit will rely instead on the conceptual framework, the level of innovation, and the potential to significantly advance our knowledge, understanding or practice. Applicants can provide appropriate justification for the proposed work through literature citations, data from other publicly available sources, or analytical and computational models. The proposed research will likely involve considerable risk that the work may not be successful, so applicants should clearly explain the significance of the work to allow the reviewers to determine whether the potential impact justifies these risks.

Award: Application budgets may not exceed \$400,000 direct costs over a maximum three-year funding period. No more than \$200,000 direct costs may be requested in any single year.

Letter of Intent: Not required

Deadline: [Standard dates](#) apply.

All applications are due by 5:00 PM local time of applicant organization. All [types of non-AIDS applications](#) allowed for this funding opportunity announcement are due on the listed date(s).

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

Grant Program: Engineering Next-Generation Human Nervous System Microphysiological Systems (R21 and R01 Clinical Trials Not Allowed)

Agency: National Institutes of Health PAR-20-082 (R21) PAR-20-055 (R01)

RFP Website: <https://grants.nih.gov/grants/guide/pa-files/PAR-20-082.html>

<https://grants.nih.gov/grants/guide/pa-files/PAR-20-055.html>

Brief Description: The purpose of this FOA is to stimulate basic technology-focused research to develop next-generation human cell-derived microphysiological systems (MPS) and related assays with improved fidelity to complex human brain, spinal cord, and/or sensory end organ circuit physiology, which will ultimately facilitate analysis of higher order functional deficits relevant to complex nervous system diseases. This FOA is distinct from others that focus on optimization and scalability of assays for compound screening, although projects could, in principle, have utility for late stage evaluation of drug efficacy and toxicity. These models will have a multi-lineage, complex architecture representing the normal characteristics and functions of the relevant nervous system structure (e.g., sensory input systems, brain or spinal integrative systems, motor output systems) and will substantially exceed the state of the art in cellular maturation and integration, allowing reproducible measurement of human-relevant circuit-level activity under physiological conditions over a long period.

This FOA encourages innovative approaches that are first-in-class, those that propose to substantially exceed the state of the art in tissue organization and function. These can be high risk, high impact designs. Additionally, this FOA encourages approaches that aim to improve robustness and reproducibility of physiologically relevant circuit or supportive systems-level measures.

Award: The combined budget for direct costs for the two-year project period may not exceed \$275,000. No more than \$200,000 may be requested in any single year. (for R21)

Letter of Intent: Not required

Deadline: [Standard dates](#) apply.

All applications are due by 5:00 PM local time of applicant organization. All [types of non-AIDS applications](#) allowed for this funding opportunity announcement are due on the listed date(s).

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

Grant Program: BRAIN Initiative: Biology and Biophysics of Neural Stimulation and Recording Technologies (R01 Clinical Trials Optional)

Agency: National Institutes of Health RFA-NS-20-006

RFP Website: <https://grants.nih.gov/grants/guide/rfa-files/RFA-NS-20-006.html>

Brief Description: The current suite of BRAIN Initiative FOAs ranges from testing new concepts for large scale recording and modulation, developing and optimizing tools for invasive and non-invasive neuromodulation, to pre-clinical and clinical studies of next generation recording and modulation technologies. This FOA fills the gap in understanding how fields produced by stimulating technologies affect the brain at a basic cellular or circuit level and understanding the origin of biological signals recorded from the brain. The new stimulation, recording, and mapping tools developed within the BRAIN initiative provide an ample toolset that can now be employed to address this gap.

The goal of this FOA is two-fold: (1) To systematically characterize, model, and validate the neurobiological, cellular, and circuit responses of neuronal and non-neuronal cells in the central nervous system (CNS) to fields produced by neural stimulation, and (2) To understand the biological and bioinformatic content of signals recorded from neuronal and non-neuronal cells and circuits in terms of the shape, size, orientation, propagation, and location of signal generators at varying temporal/spatial scales. Proposed studies should lead to deeper understanding of how electrical and chemical activities in different populations of neurons and glia are represented in macroscopic-level measurements of brain structure and function. In this context, “validation” is defined as models at the cellular and local circuit level, however, models may span multiple scales from non-invasively applied fields down to electrical stimulation from micro and nanoscale devices. Proposed outcomes from these efforts may include: cell activation thresholds, sub-threshold changes to membrane voltage, cellular morphological changes, metabolic changes, changes in cell-cell interactions, the many possible aspects of local circuit plasticity in response to varied stimulation protocols, defining principles by which signals decay or amplify across scales, and/or understanding of the structure/function relationship of defined units in the brain using recording techniques.

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: March 24, 2020, June 2, 2020, October 1, 2020, February 2, 2021, June 1, 2021, October 1, 2021, February 1, 2022, June 1, 2022, and October 3, 2022

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.

All applications are due by 5:00 PM local time of applicant organization. All [types of non-AIDS applications](#) allowed for this funding opportunity announcement are due on the listed date(s).

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

Grant Program: Glial Plasticity in the Aging Brain (R01 Clinical Trial Not Allowed)

Agency: National Institutes of Health RFA-AG-21-010

RFP Website: <https://grants.nih.gov/grants/guide/rfa-files/RFA-AG-21-010.html>

Brief Description: This FOA encourages research on within-glial-cell-type heterogeneity and diversity in the aging brain. Functionally defining glial diversity in the aging brain will provide the foundation for future work expanding on these findings as potential mechanisms of vulnerability and resilience to diseases of aging, such as Alzheimer’s disease and its related dementias. While the primary goal of the FOA is to promote research on brain aging, applications proposing to include studies of Alzheimer’s disease as a means of comparison to the aging process are permitted.

Appropriate topics include, but are not limited to, the following:

- Investigating the cellular and molecular pathways driving glial heterogeneity within cell types during aging, including whether sex-based differences contribute to glial diversity in the aging brain.
- Reprogramming targeted age-associated glial cell subtypes and/or broad glial landscapes to understand their impact on physiological function and resilience.
- Comparing the functional implications of age-associated glial cell subtypes in brain regions most vulnerable versus resistant to neurodegeneration.
- Assessing the functional consequences of introducing age-associated glial subtypes to the young brain and how this compares to introducing young-associated glial subtypes to the aged brain.
- Comparing how glial subtypes characteristic of the aged brain interact with other glial cell types and neurons.
- Confirming the human relevance of age-related glial subtypes discovered in animal models relevant to human brain aging.
- Conducting in silico analyses to uncover new relationships between glial subtypes, aging, neurodegeneration, and brain function.

Award: Application budgets are limited to \$250,000 in direct costs per year. The maximum project period is 5 years.

Letter of Intent: May 17, 2020

Deadline: June 17, 2020

All applications are due by 5:00 PM local time of applicant organization. All [types of non-AIDS applications](#) allowed for this funding opportunity announcement are due on the listed date(s).

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

Grant Program: Jointly Sponsored Ruth L. Kirschstein National Research Service Award Institutional Predoctoral Training Program in the Neurosciences (T32 Clinical Trial Not Allowed)
Agency: National Institutes of Health PAR-20-076

RFP Website: <https://grants.nih.gov/grants/guide/pa-files/PAR-20-076.html>

Brief Description: The purpose of the Jointly Sponsored Predoctoral Training Program in the Neurosciences (JSPTPN) is to provide strong, broad neuroscience training that will enable students to become successful research scientists at a time when the field is advancing at an astonishing pace. Neuroscience research increasingly requires investigators who can cross boundaries, draw on knowledge and approaches from various disciplines and levels of analysis, and apply this breadth of knowledge in novel ways to yield new discoveries about the nervous system. Moreover, the ability to conduct impactful neuroscience research requires strong foundational skills in experimental design, statistical methodology and quantitative reasoning related to study design, analysis and interpretation.

Breakthroughs in neuroscience have come, and will continue to come, not only from a deep and broad understanding of the nervous system, but also from an understanding of biological systems not historically associated with neuroscience. For example, blood brain barrier function is now known to be heavily dependent on the multidrug resistance transporter, inflammatory responses are key components of many neurological disorders, and metabolic processes historically associated with biology or diseases outside the nervous system are now known to play a role in both normal brain function and neurobiological disorders. To achieve the goals of the JSPTPN, students should therefore be exposed to a broad spectrum of relevant science. In addition, the training supported by the JSPTPN must be grounded

in principles of rigorous experimental design, an understanding of the critical need for, and proper use of, statistics, and quantitative literacy.

Broad-based Research Training. The JSPTPN supports a program of broad-based education and research experience during the first two years of graduate training. As such, training programs supported by a JSPTPN training grant must have a comprehensive, two-year training plan.

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 26, 2020; May 25, 2021; May 25, 2022

All applications are due by 5:00 PM local time of applicant organization. All [types of non-AIDS applications](#) allowed for this funding opportunity announcement are due on the listed date(s).

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

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

Grant Program: Fiscal Year (FY) 2021 Funding Opportunity Announcement (FOA) for the Office of Naval Research (ONR) Manufacturing Science Program

Agency: Department of Defense Office of Naval Research N00014-20-S-F002

Website: <https://www.onr.navy.mil/work-with-us>

Brief Description: While the scientific foundations behind most present-day manufacturing technologies have long been established, potential advances in current technologies as well as the development of new manufacturing techniques often require a new scientific knowledge base to provide the foundation for those processes to develop into viable and reliable manufacturing technologies. The Manufacturing Science program addresses the need for fundamental research programs to support these new and novel manufacturing technologies for the Navy. Recent advances in computational modeling capabilities have facilitated the intelligent design of new manufacturing capabilities, the models to predict their performance, and the experimental strategies to best achieve them. These new predictive models can provide powerful benefits for the development of new manufacturing technologies and the capabilities that can be achieved. Program Objectives: The objective of the Manufacturing Science program is to support fundamental scientific research that will help facilitate or enable the advancement/development of manufacturing technologies for Naval components. Research proposals are encouraged to include a modeling component to help direct the research. The focus of the Manufacturing Science program is on Naval manufacturing, preference will be given to Naval-unique or Naval-centric topics.

Awards: Under this Manufacturing Science Program FOA competition, ONR intends to award up to an estimated total value of \$650,000.00 subject to the availability of funds. Each individual award will be up to a maximum of \$100,000 per year, for a period of one (1), two (2) or three (3) years.

Proposal Deadline: White papers are a MANDATORY component of a two-part submission process.

White Papers Submission: 06 March 2020

Full Proposal: 08 June 2020

Contact Information: Dr. Richard W. Fonda

Title: Manufacturing Science Program Manager

Office of Naval Research

Email: richard.fonda@navy.mil

Grant Program: Quantum Characterization of Intermediate Scale Systems (QCISS)

Agency: Department of Defense Department of Army Material Command W911NF20S0004

Website: <https://www.arl.army.mil/business/broad-agency-announcements/>

Brief Description: The U.S. Army Research Office (ARO) in partnership with the National Security Agency (NSA) is soliciting proposals for research in Quantum Characterization of Intermediate Scale Systems (QCISS). The goal of the BAA is to develop efficient and practical protocols and techniques that allow Quantum Characterization, Verification, and Validation (QCVV) of larger systems with direct relevance to Fault Tolerant Quantum Computing (FTQC), and to demonstrate these protocols on intermediate-scale systems. In this BAA, intermediate-scale refers to systems of size 10-20 qubits and larger systems greater than 20 qubits. Proposals are sought to develop reliable, efficient, and scalable protocols for evaluating intermediate-scale quantum systems and selectively characterizing only the subset of information relevant to FTQC. These new methods are sought as the next advances that will empower the quantum computing community to reliably interpret and evaluate emerging larger-scale quantum systems, and not merely a continuation of work applicable to one or two-qubit QCVV. The program success criterion is to identify the subset of information needed to characterize, verify, and validate a system's behavior relevant for FTQC and create a suite of procedures for measuring that information.

Quantum computing research has reached an exciting phase where controllable multi-qubit systems are becoming available across a number of venues, including academic laboratories, industry offerings, and even on the cloud. Demonstrations of progressively more sophisticated algorithms are occurring, and achieving 'quantum advantage' seems to be on the horizon. In order to evaluate and continue to improve quantum hardware, relevant protocols must be identified and used to characterize, verify, and validate the performance of these intermediatescale quantum processing systems. However, QCVV of these increasingly complex quantum systems remains a challenge. The challenge being that as the number of qubits in a quantum system increases, the Hilbert space that defines the system grows exponentially, and the resources needed for complete characterization correspondingly grows exponentially. These resource limitations are already being encountered in small quantum systems of about 10 qubits. For continued progress, an additional challenge to overcome is to be able to identify a smaller subset of parameters that allow system performance to be predicted and understood for applications of interest without the need for full characterization.

Two categories of proposals are sought for this BAA. The first category seeks proposals that integrate theoretical and experimental research to fully identify and address the challenges of QCVV for intermediate-scale quantum systems. The second category seeks theoretical research that may significantly advance QCVV for intermediate-scale quantum systems through novel approaches that retire a set of key challenges.

Awards: Various

Proposal Deadline: White Papers: 4:00 PM Eastern Time on: 28 JANUARY 2020

Proposals: 4:00 PM Eastern Time on: 17 MARCH 2020

Contact Information: Quantum Characterization of Intermediate Scale Systems (QCISS) BAA usarmy.rtp.rdecom-aro.mesg.qcbox@mail.mil

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

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

Agency: Department of Defense Naval Research Laboratory N00173-19-S-BA01

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

Brief Description: The Naval Research Laboratory (NRL) The Naval Research Laboratory (NRL) is the Navy's corporate laboratory. NRL conducts basic and applied research for the Navy in a variety of scientific and technical disciplines. The basic research program is driven by perceptions about future

requirements of the Navy. NRL conducts most of its research program at its own facilities but also funds some related research such as anticipated by this announcement. More extensive research support opportunities are available from the Naval Research Laboratory (NRL). NRL announcements may be accessed via the Internet at <https://www.nrl.navy.mil/doingbusiness/contracting-division/baa>.

NRL is interested in receiving proposals for Long-Range Science and Technology (S&T) Projects which offer potential for advancement and improvement of Navy and Marine Corps operations. Readers should note that this is an announcement to declare NRL's broad role in competitive funding of meritorious research across a spectrum of science and engineering disciplines. A brief description of the NRL Program Codes and the science and technology thrusts that NRL is pursuing is provided below. Additional information can be found at the NRL website at <https://www.nrl.navy.mil/research/directorates-divisions/>.

Awards: Various

Proposal Deadline: September 05, 2020

Contact Information: Mary A Johnson; Procurement Analyst; Phone 202-767-2021

[General Inquiries](#)

Grant Program: Air Superiority Technology Broad Agency Announcement

Agency: Department of Defense FA8651-20-S-0008

Website:

<https://www.fbo.gov/index?s=opportunity&mode=form&id=dbdb4a35cb22a4a0d8414b652f0c74bb&tab=core&cvview=0>

Brief Description: For purposes of this announcement, research is defined to be scientific study and experimentation directed at increasing knowledge and understanding in relation to long term national security needs. It is an enhancement to related exploratory and advanced development programs. A program should be designed to demonstrate well-defined and substantive research results, should not be overly ambitious or open-ended, and should not be a paper study that inherently requires a substantial testing effort.

RESEARCH AREA 1 – MODELING, SIMULATION, & ANALYSIS (MS&A): The objective of this work is to develop/modify and employ models used to analyze Air Superiority concepts and their related concepts of employment. The objective is to apply, modify and/or combine engineering, engagement (one-on-one), mission (few-on-few), systems-of-systems, campaign (many-on-many, military worth), level modeling techniques, tools, and analysis methods as well as virtual and constructive digital simulation which lend themselves to the quick and effective evaluation of air superiority concepts. Concepts include, but are not limited to, intercommunicative weapons, novel damage mechanisms, lethal and novel destruct mechanisms, multiple targeting, and time critical delivery. Detailed modeling includes, but is not limited to, sensors, aerodynamics, autopilots, navigation and guidance schemes, propulsion, warheads, fuzes, datalinks, fire control, launcher, suspension, carriage and release, error filters, environment (wind, fog, and dust), lethality, vulnerability, and threats.

RESEARCH AREA 2 – INNOVATIVE AIRCRAFT INTEGRATION TECHNOLOGIES The objective of this work is to design, develop, and demonstrate innovative aircraft integration technologies including but not limited to physical, electrical, and logical interfaces; and other aspects of aircraft integration that may be applicable.

RESEARCH AREA 3 –FIND-FIX-TARGET-TRACK (F2T2) & DATALINK TECHNOLOGIES The objective of this work is to design, develop, and demonstrate innovative Find, Fix, Target, and Track (F2T2) technologies for the detection of threats to aircraft. These F2T2 technologies should provide threat warning, threat characteristics, You Are The One (YATO) or You Are Not The One (YANTO)

discrimination, highly accurate threat cueing, range and range rate, and other pertinent information required to analyze and coordinate a response to a threat.

RESEARCH AREA 4 – ENGAGEMENT MANAGEMENT SYSTEM TECHNOLOGIES The objective of this work is to design, develop, and demonstrate an innovative Engagement Management system to maximize aircraft survivability in increasingly contested environments while minimizing false positives and engagement costs. These technologies should interface with aircraft and other Find-Fix-Target-Track (F2T2) systems, determine the optimum counter measure response(s), respect keep-out or no-fire zones, and make other decisions required for aircraft survivability.

RESEARCH AREA 5 – HIGH VELOCITY FUZING The objective of this work is to design, develop, and demonstrate high velocity fuzing, including both Electronic Safe and Arm (ESAF) technologies that can safely initiate a warhead and Target Detection Devices (TDDs) that can provide miniaturized, fast-responding, highly accurate range and location information for high closure velocity intercepts.

RESEARCH AREA 6 – MISSILE ELECTRONICS The objective of this work is to investigate all aspects of Missile Power & Electronics as it applies to air-to-air missiles. The following technologies and research areas are of particular interest: Power Conversion and Distribution, Power Generation and Storage Technologies (Advanced Missile Battery Technology and Ultracapacitors), Guidance Electronics, and Thermal Management.

RESEARCH AREA 7 – MISSILE GUIDANCE AND CONTROL TECHNOLOGIES The objective of this work is to investigate Missile Guidance and Control Technologies to include the following: Robust guidance algorithms against maneuvering targets, real time optimal lofting/energy management techniques, integrated guidance and control, reduced latency between seeker measurements and final control fin commands, highly accurate seeker technologies and algorithms, robust and novel target state estimators, third party queuing, optimal body orientation at endgame encounter, (reinforcement learning-adaptive control) approach, simultaneous learning and control, Hybrid (switched) guidance law selection based on the red-target strategy/maneuver, many-on-many engagement guidance laws, optimal pulse delay and propellant allocation, rapid flexible autopilot design process, robust control in aerodynamic cross coupling environments for various airframe designs from canard to tail control, robust control at high angles of attack, innovative autopilot architectures, efficient verification of safe separation over all flight regimes, Non-linear/adaptive control for agile maneuver, and advanced airframe control techniques.

RESEARCH AREA 8 – ADVANCED WARHEAD TECHNOLOGIES

More areas; Please see the BAA on above website.

Awards: Various

Proposal Deadline: This BAA will remain open through 31 October 2024 or until amended or superseded. It may be reissued and/or amended periodically, as needed. This BAA is set up in two parts: (1) Basic Open BAA, in which white papers may be submitted at any time during the open period, and (2) CALL BAA, in which proposal CALL announcements may be issued by the Government in FedBizOpps or Grants.gov under FA8651-20-S-0008. This BAA is intended to cover Applied Research, Advanced Technology Development and Advanced Component Development & Prototypes.

Contact Information: Technical POC: Mr. David Hartline , AFRL, (850) 882-1324

david.hartline.1@us.af.mil

Grant Program: DSO Office-wide Broad Agency Announcement

Agency: Department of Defense DARPA HR001119S0071

Website: <https://www.darpa.mil/work-with-us/opportunities?tFilter=&oFilter=2&sort=date>
https://www.fbo.gov/index?s=opportunity&mode=form&id=22a346a8b55f0a7040d57a8fbc19e644&tab=core&_cview=1

Brief Description: The mission of the Defense Advanced Research Projects Agency (DARPA) Defense Sciences Office (DSO) is to identify and create the next generation of scientific discovery by pursuing high-risk, high-payoff research initiatives across a broad spectrum of science and engineering disciplines and transforming these initiatives into disruptive technologies for U.S. national security. In support of this mission, the DSO Office-wide BAA invites proposers to submit innovative basic or applied research concepts that address one or more of the following technical domains: (1) Frontiers in Math, Computation and Design, (2) Limits of Sensing and Sensors, (3) Complex Social Systems, and (4) Anticipating Surprise. Each of these domains is described below and includes a list of example research topics that highlight several (but not all) potential areas of interest. Proposals must investigate innovative approaches that enable revolutionary advances. DSO is explicitly not interested in approaches or technologies that primarily result in evolutionary improvements to the existing state of practice.

Awards: The total award value for the combined Phase 1 base and Phase 2 option is limited to \$1,000,000. This total award value includes Government funding and performer cost share (if required).

Proposal Deadline: Executive Summary Due Date: June 12, 2020, 4:00 p.m. o Abstract Due Date: June 12, 2020, 4:00 p.m. o Full Proposal Due Date: June 12, 2020, 4:00 p.m.

Contact Information: BAA Email: HR001119S0071@darpa.mil

Department of Transportation

Grant Program: Dwight David Eisenhower Transportation Fellowship Program (DDETFP) Grants or Research Fellowship (GRF)

Agency: Department of Transportation 693JJ318NF5229-2019

Website:

https://www.fhwa.dot.gov/innovativeprograms/centers/workforce_dev/post_secondary_education.aspx

Brief Description: The Dwight David Eisenhower Transportation Fellowship Program (DDETFP) awards fellowships to students pursuing degrees in transportation-related disciplines ([PDF](#) or [HTML](#)). This program advances the transportation workforce by helping to attract the nation's brightest minds to the field of transportation, encouraging future transportation professionals to seek advanced degrees, and helping to retain top talent in the U.S. transportation industry. This funding opportunity is open to students that are U.S. citizens and non-U.S. citizens. The students must be enrolled in an IHE which must be accredited by a federally-recognized accrediting agency and must be located within the United States or its territories, both administratively as well as the campus the student is attending.

Awards: The anticipated stipends for the DDETFP GRF are based on academic level and shall be calculated as follows: Monthly Stipend: Master's Level: Up to \$1,700; Doctoral Level: Up to \$2,000

Proposal Deadline: July 25, 2019 at 3:00pm Eastern Time.

Contact Information: Ewa Flom Program Manager Phone 703-235-0532 ewa.flom@dot.gov

Department of Agriculture:

Grant Program: Women and Minorities in STEM Fields

Agency: Department of Agriculture USDA-NIFA-WAMS-007011

Website: <https://nifa.usda.gov/funding-opportunity/women-and-minorities-science-technology-engineering-and-mathematics-fields>

Brief Description: The purpose of this program is to support research, education/teaching, and extension projects that increase participation by women and underrepresented minorities from rural areas in STEM. NIFA intends this program to address educational needs within broadly defined areas of food, agriculture,

natural resources, and human (FANH) sciences. Applications recommended for funding must highlight and emphasize the development of a competent and qualified workforce in the FAHN sciences. WAMS-funded projects improve the economic health and viability of rural communities by developing research and extension initiatives that focus on new and emerging employment opportunities in STEM occupations. Projects that contribute to the economic viability of rural communities are also encouraged.

Awards: Anticipated Funding: \$400,000

Submission Deadline: Monday, February 24, 2020

Contact: Technical Contact: Siva Sureshwaran at Email: sivapathasun.sureshwaran@usda.gov

Grant Program: Integrated Research, Education, and Extension Competitive Grants Program – Organic Transitions

Agency: Department of Agriculture USDA-NIFA-ICGP-007010

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

Brief Description: The overall goal of the Organic Transitions Program (ORG) is to support the development and implementation of research, extension and higher education programs to improve the competitiveness of organic livestock and crop producers, as well as those who are adopting organic practices. NIFA administers the ORG program by determining priorities in U.S. agriculture through Agency stakeholder input processes in consultation with the NAREEEAB. ORG will continue to prioritize environmental services provided by organic farming systems in the area of soil conservation, pollinator health, and climate change mitigation, including greenhouse gases (GHG), as well as the development of educational tools for Cooperative Extension personnel and other agricultural professionals who advise producers on organic practices, and development of cultural practices and other allowable alternatives to substances recommended for removal from the National Organic Program's National List of Allowed and Prohibited Substances. It is expected that all projects will integrate research, education and extension activities, as appropriate to project goals, although some projects may be weighted more heavily than others in one or more of these areas. However, all proposals should have activities and impact in research and at least one of the other areas: education and extension.

Awards: Up to \$500,000; Anticipated Funding: \$5,800,000

Submission Deadline: February 27, 2020

Contact: Technical Contact: Mathieu Ngouajio, Phone (202) 570-1915; Email: mathieu.ngouajio@usda.gov

Grant Program: REAP-Renewable Energy Systems and Energy Efficiency Improvements

Agency: Department of Agriculture RDBCP-11-REAP-RES-EEI-2020

Website: <https://www.govinfo.gov/content/pkg/FR-2019-08-30/pdf/2019-18825.pdf>

Brief Description: Eligible applicants are agricultural producers and rural small businesses. All agricultural producers, including farmers and ranchers, who gain 50% or more of their gross income from the agricultural operations are eligible. Small businesses that are located in a rural area can also apply. Rural electric cooperatives may also be eligible to apply. Additional Information on Eligibility: Citizenship - To be eligible, applicants must be individuals or entities at least 51 percent owned by persons who are either: 1) citizens of the United States (U.S.), the Republic of Palau, the Federated States of Micronesia, the Republic of the Marshall Islands, or American Samoa; or 2) legally admitted permanent residents residing in the U.S. Project - The project must be to conduct a feasibility study for a renewable energy system. Eligible technologies include: projects that produce energy from wind, solar,

biomass, geothermal, hydro power and hydrogen-based sources. All projects must be located in a rural area and must be owned by the applicant.

Awards: Up to \$500,000; Anticipated Funding: \$70 million

Submission Deadline: September 30, 2020

Contact: Technical Contact: Maureen Hessel, Energy Specialist, Phone 202-401-0142

Department of Labor

Grant Program: Apprenticeships: Closing the Skills Gap

Agency: Department of Labor FOA-ETA-19-09

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

Brief Description: Building on the experience abroad and in the United States, apprenticeships have emerged as a proven skills instruction model to meet industry's demand for a skilled American workforce. As the 21st economy requires greater skills development with an estimated 65 percent jobs of all jobs requiring some post-secondary education by 2020,¹ apprenticeship programs can bolster the employability and technical skills of workers while meeting the workforce needs of business and industry.

There are more than 7.1 million job openings right now in the United States,³ many of which require a skilled workforce. These include in-demand cybersecurity professions and emerging occupations involving artificial intelligence (AI) across several industry sectors. Expanding apprenticeships can help individuals gain the skills necessary to fill these vacancies and help employers find skilled workers more readily. The period of performance is 48 months with an anticipated start date of February 1, 2020.

The purpose of this grant program is to promote apprenticeships as a significant workforce solution in filling current job vacancies and closing the skills gap between employer workforce needs and the skills of the current workforce. The overarching goals of this grant program are threefold: (1) to accelerate the expansion of apprenticeships to industry sectors and occupations that have not traditionally deployed apprenticeships for building a skilled workforce, such as cybersecurity, artificial intelligence, and health care; (2) to promote the large-scale expansion of apprenticeships across the nation to a range of employers, including small and medium-sized employers; and (3) to increase apprenticeship opportunities for all Americans. Recognizing that apprenticeship is a training strategy that operates on both the supply side and the demand side of the labor market, this grant program aims to increase both the number of apprenticeship positions and the ability of all Americans to gain access to this proven pathway to family-sustaining careers.

Awards: We will award up to \$100 million in H-1B funds initially to fund approximately 16 to 30 apprenticeship grants, with awards ranging from \$500,000 to \$6 million.

Anticipated Funding: \$100,000,000

Proposal Deadline: September 24, 2019 no later than 4:00:00 p.m. Eastern Time. Passed: FYI

Contact Information: Denise Roach Grants Management Specialist roach.denise@dol.gov

EPA

Grant Program: Solid Waste Recycling Enhancement Act (REA) Higher Education Research Grant Program

Agency: NJ Department of Environmental Protection

Website: <https://www.nj.gov/dep/grantandloanprograms/swrea-higher-ed.htm>

Brief Description: This funding opportunity seeks to fund projects that support the objectives of the Recycling Enhancement Act. Eligible projects cover one or more of recycling demonstration, research or education, including professional training areas. Proposals may be designed to enhance existing resources, tools, or methodologies or create new resources pursuant to the Recycling Enhancement Act.

Awards: Approximately \$1,000,000 of REA recycling tax funds have been allocated for this funding opportunity. Awardees and grant amounts will be selected based on the proposal, selection criteria and funds available to the Department.

Submission Deadline: December 13, 2019

Contact: Technical Contact: Fredrik Khayati, NJ Department of Environmental Protection, Division of Solid and Hazardous Waste; Phone: 609-984-4250

fredrik.khayati@dep.nj.gov

Department of Energy

Grant Program: National Quantum Information Science Research Centers

Agency: Department of Energy DE-FOA-0002253

Website: https://science.osti.gov/-/media/grants/pdf/foas/2020/SC_FOA_0002253.pdf

Brief Description: DOE SC hereby announces its interest in receiving applications from multi-institutional, multidisciplinary teams (requesting support between \$10 and \$25 million per year) to establish National Quantum Information Science Research Centers referred to in the rest of this announcement as “Centers.” The goal of this FOA is to select applications that will accelerate the transformational advances in basic science and quantum-based technology needed to develop world-leading capabilities in Quantum Information Science (QIS), and in support of the National Quantum Initiative Act.¹ This FOA is open to multi-institutional proposals submitted as a single application by the lead institution.

Awards: DOE anticipates that the total value of awards over a five-year project period made under this FOA will be between \$100 million and \$625 million, subject to the availability of future year appropriations.

Proposal Submission Deadline: Pre-applications are required and must be submitted by 02/10/2020. A response encouraging or discouraging the submission of a proposal will be provided by 03/10/2020. Only encouraged applications will be considered for merit-review. Applications submitted on behalf of investigators that did not submit a preapplication and applications that do not follow the guidelines and criteria established below may be declined without merit review.

Contact: Advanced Scientific Computing Research, SC-21.1

Dr. Ceren Susut Ceren.Susut-Bennett@science.doe.gov

Grant Program: Seeding Critical Advances for Leading Energy Technologies with Untapped Potential 2019

Agency: Department of Energy DE-FOA-0002166

Website: <https://arpa-e-foa.energy.gov/#FoaId0a357909-3acf-4e0e-a0b0-3a02f16a3ed7>

Brief Description: The Seeding Critical Advances for Leading Energy technologies with Untapped Potential (SCALEUP) solicitation provides a vital mechanism for the support of innovative energy R&D that complements ARPA-E’s primary R&D focus on early-stage transformational energy technologies that still require proof-of-concept.

ARPA-E’s mission is to develop transformational energy technologies in support of U.S. national security and economic competitiveness. ARPA-E funds the R&D of technologies to build and maintain U.S.

technological leadership in highly competitive global energy markets, thus supporting American jobs and economic growth. ARPA-E's authorizing statute directs the Agency to develop linkages between its sponsored applied research and the marketplace.^[1] These linkages are central to realizing the public's return on technology investments.

An enduring challenge to ARPA-E's mission is that even technologies that achieve substantial technical advancement under ARPA-E support are at risk of being stranded in their development path once ARPA-E funding ends (averaging \$2.5M over three years). ARPA-E-funded technologies typically face significant remaining technical risks upon completion of an award's funding period. Experience across ARPA-E's diverse energy portfolios, and with a wide range of investors, indicates that pre-commercial "scaling" projects are critical to establishing that performance and cost parameters can be met in practice for these very early stage technologies. These pre-commercial scaling projects aim to translate the performance achieved at bench scale to commercially scalable versions of the technology, integrate the technology with broader systems, provide extended performance data, and validate the manufacturability and reliability of new energy technologies. (These projects are often termed "pre-pilot" development in different industries.) Success in these scaling projects would enable industry, investors, and partners to justify substantial commitments of financial resources, personnel, production facilities, and materials to develop promising ARPA-E technologies into early commercial products.

Awards: Various; Anticipated available funding: \$52,000,000

Proposal Submission Deadline: Preliminary Application Submission Deadline: 2/14/2020 9:30 AM ET

- Full Application Submission Deadline: TBD

Contact: ExchangeHelp@hq.doe.gov

Please contact the email address above for questions regarding ARPA-E's online application portal, ARPA-E eXCHANGE.

- ARPA-E-CO@hq.doe.gov

Please contact the email address above for questions regarding Funding Opportunity Announcements. ARPA-E will post responses on a weekly basis to any questions that are received. ARPA-E may re-phrase questions or consolidate similar questions for administrative purposes.

Grant Program: Extreme Environment Materials for Power Generation

Agency: Department of Energy DE-FOA-0002192

Website: <https://www.netl.doe.gov/node/9342>

Brief Description: This Funding Opportunity Announcement will fill a gap with advanced materials and technologies to enhance the reliability and performance of the existing fleet while reducing O&M costs. The Crosscutting High Performance Materials Program has a unique ability to identify needs and foster technology development across many applications. Materials challenges will be targeted that apply to both coal-based and gas-based steam cycle components. Gas turbine applications will be considered non-responsive and hence any gas-focused work should focus on the bottoming cycle of a Natural Gas Combined Cycle (NGCC). The Program focuses on development and validation of materials and technologies for existing and new fossil power generation applications with improved cost, performance, and reliability. This not only supports fossil power generation but also provides targeted support to the nation's high-temperature materials supply chain thereby enhancing competitiveness in the global marketplace.

Awards: Various; Anticipated available funding: \$20,000,000

Proposal Submission Deadline: February 21, 2020

Contact: Bethan K. Young 412-386-4402 bethan.young@netl.doe.gov

Grant Program: FY20 Vehicle Technologies Program Wide Notice of Intent

Agency: Department of Energy DE-FOA-0002222

Website: <https://eere-exchange.energy.gov/#FoaId7e88bb0b-dea3-49c3-b111-a81cef71d2bc>

Brief Description: The Office of Energy Efficiency and Renewable Energy (EERE) intends to issue, on behalf of the Vehicle Technologies Office (VTO), a Funding Opportunity Announcement (FOA) entitled “Fiscal Year 2020 Advanced Vehicle Technologies Funding Opportunity Announcement (FOA).”

VTO supports a broad portfolio of advanced vehicle technologies that can strengthen national security, enable future economic growth, support American energy dominance, and increase transportation affordability for all Americans. This portfolio includes advanced batteries, electric drive systems; smart charging technologies; energy efficient mobility technologies and systems; advanced combustion engines and fuels; materials for vehicle light-weighting; technology integration, which includes work with the national network of Clean Cities coalitions; and transportation and energy analysis.

Awards: Various

Proposal Submission Deadline: Concept Paper Submission Deadline: TBD

- Full Application Submission Deadline: TBD

Contact: Jodi L. Collins jodi.collins@netl.doe.gov. EERE plans to issue the FOA in January/February 2020 via the EERE Exchange website <https://eere-exchange.energy.gov/>

Grant Program: Notice of Intent: FY20 Bioenergy Technologies Office Multi-Topic Funding Opportunity

Agency: Department of Energy DE-FOA-0002202

Website: <https://eere-exchange.energy.gov/#FoaId9e05c1b0-f1ab-44d1-8445-22f013f15d2a>

Brief Description: The Office of Energy Efficiency and Renewable Energy (EERE) intends to issue, on behalf of the Bioenergy Technologies Office (BETO), a Funding Opportunity Announcement (FOA) entitled “FY20 Bioenergy Technologies Multi-Topic FOA”.

BETO develops technologies that convert domestic biomass and waste resources into fuels, products, and power to enable affordable energy, economic growth, and innovation in renewable energy and chemicals production. The activities funded through this opportunity will be a component of the comprehensive U.S. energy strategy to enhance energy supply, create domestic jobs, secure the nation’s global leadership in bioenergy technologies and improve U.S. energy security.

This FOA will support high-impact technology research and development (R&D) to enable growth and innovation of the Bioeconomy. The topic areas will focus on BETO's objectives to reduce the minimum fuel selling price of drop-in biofuels, lower the cost of biopower, and enable high-value products from biomass or waste resources.

This notice of intent (NOI) is issued so that interested parties are aware of EERE’s intention to issue this FOA in the near term. All of the information contained in this NOI is subject to change. EERE will not respond to questions concerning this NOI. Once the FOA has been released, EERE will provide an avenue for potential applicants to submit questions.

Awards: Various

Proposal Submission Deadline: Full Application Submission Deadline: TBD

Contact: Jodi L. Collins jodi.collins@netl.doe.gov. EERE plans to issue the FOA in January/February 2020 via the EERE Exchange website <https://eere-exchange.energy.gov/>

Grant Program: Environmental System Science

Agency: Department of Energy DE-FOA-0002184

Website: <https://science.osti.gov/ber/Funding-Opportunities>

Brief Description: The DOE SC program in Biological and Environmental Research (BER) hereby announces its interest in receiving applications for research in Environmental Systems Science (ESS), including Terrestrial Ecosystem Science (TES) and Subsurface Biogeochemical Research (SBR). The goal of the Environmental System Science (ESS) activity in BER is to advance a robust, predictive understanding of the set of interdependent physical, biogeochemical, ecological, hydrological, and geomorphological processes for use in Earth system, ecosystem and reactive transport models. Using an iterative approach to model-driven experimentation and observation, and interdisciplinary teams, ESS-supported scientists work to unravel the coupled physical, chemical and biological processes that control the structure and functioning of terrestrial ecosystems and integrated watersheds across critical spatial and temporal scales. This FOA will consider applications that focus on improving the understanding and representation of terrestrial and subsurface environments in ways that advance the sophistication and capabilities of local, regional, and larger scale models. Using new measurements, field experiments, more sophisticated modeling and/or synthesis studies, this FOA will encompass two topic areas: 1) Terrestrial Ecology, specifically linking above and belowground processes, as well as methane biogeochemistry; and 2) Subsurface and Watershed Hydro-biogeochemistry, specifically studying the function and dynamics of hydro-biogeochemical processes within watersheds. All applications are required to clearly delineate an integrative, hypothesis-driven approach and describe the existing needs/gaps in state-of-the-art models. Applicants should provide details on how the results of the proposed research will be used to improve the predictability and sophistication of integrated watershed systems and/or terrestrial ecosystem models.

Awards: Various

Proposal Submission Deadline: Submission Deadline for Pre-Applications: December 5, 2019, at 5:00 pm Eastern Time Pre-Application Response Date: December 19, 2019, at 11:59 pm Eastern Time Submission Deadline for Applications: February 20, 2020, at 11:59 pm Eastern Time.

Submit letters of intent, preapplications, and applications well ahead of stated deadlines.

Contact: Dr. Daniel Stover 301-903-0289 Daniel.Stover@science.doe.gov

Grant Program: FY 2020 Continuation of Solicitation for the Office of Science Financial Assistance Program

Agency: Department of Energy DE-FOA-0002181

Website: <https://science.osti.gov/ber/Funding-Opportunities>

Brief Description: The SC mission is to deliver scientific discoveries and major scientific tools to transform our understanding of nature and advance the energy, economic and national security of the United States. SC is the Nation's largest Federal sponsor of basic research in the physical sciences and the lead Federal agency supporting fundamental scientific research for our Nation's energy future. SC accomplishes its mission and advances national goals by supporting:

- The frontiers of science—exploring nature's mysteries from the study of fundamental subatomic particles, atoms, and molecules that are the building blocks of the materials of our universe and everything in it to the DNA, proteins, and cells that are the building blocks of life. Each of the programs in SC supports research probing the most fundamental disciplinary questions.
- The 21st Century tools of science—providing the nation's researchers with 27 state-of-the-art national scientific user facilities - the most advanced tools of modern science - propelling the U.S. to the forefront of science, technology development and deployment through innovation.
- Science for energy and the environment—paving the knowledge foundation to spur discoveries and innovations for advancing the Department's mission in energy and environment. SC supports a wide range of funding modalities from single principal investigators to large team-based activities to engage in fundamental research on energy production, conversion, storage, transmission, and use, and on our understanding of the earth systems.

Awards: Various; Available Funding: \$250,000,000

Proposal Submission Deadline: A Pre-Application is optional/encouraged. September 30, 2020

Contact: SC.Grantsandcontracts@science.doe.gov

NASA

Grant Program: ROSES 2019: Sustainable Land Imaging-Technology

Agency: NASA NNH19ZDA001N-SLIT

Website: <https://nspires.nasaprs.com/external/solicitations/summary.do?solId=%7B628D67E6-7DF9-6DE8-B052-940659BC37F4%7D&path=&method=init>

Brief Description: The aim of the Sustainable Land Imaging-Technology (SLI-T) program is to develop next-generation technology for a long-term programmatically sustainable system that as a minimum continues the historical measurement capability, and potentially improves this capability. Technology developed under this program will be considered for infusion over the lifetime of the program as a potential contributing element of the long-term sustainable program.

Awards: Various; Available funding: \$1,250,000

Proposal Deadline: April 07, 2020; Pre-proposal deadline may be earlier. Please check with program officer.

Contact: Prospective proposers are requested to submit any questions in writing to sachidananda.r.babu@nasa.gov no later than 30 days before the proposal due date.

Grant Program: Future Investigators in NASA Earth and Space Science and Technology

Agency: NASA NNH19ZDA001N-FINESST

Website: <https://nspires.nasaprs.com/external/solicitations/summary.do?solId=%7BE16CD59F-29DD-06C0-8971-CE1A9C252FD4%7D&path=&method=init>

Brief Description: The Future Investigators in NASA Earth and Space Science and Technology (FINESST) is a new program element in Research Opportunities in Space and Earth Sciences (ROSES)-2019. ROSES is an "omnibus" solicitation, having default guidelines and information in the ROSES Summary of Solicitation that apply to all of ROSES, including this program element. Through FINESST, the Science Mission Directorate (SMD) solicits proposals from accredited U.S. universities and other eligible organizations for graduate student-designed and performed research projects that contribute to SMD's science, technology and exploration goals. The Future Investigator (FI, i.e., the student participant) shall have the primary initiative to define the proposed FINESST research project and must be the primary author, with input or supervision from the proposal's Principal Investigator (PI), as appropriate. In cases when the PI already has an ongoing research award from NASA, the research proposed under FINESST may address a similar topic, but the proposal should make clear how the proposed research goes beyond what NASA has already agreed to support.

Awards: The number of proposals selected will be dependent on the number and quality of proposals submitted and on the availability of funds from the relevant SMD program.

Proposal Deadline: Proposals may be submitted at any time until 11:59 pm ET on February 4, 2020.

Contact: Emails FINESST Program Scientists by Division: Earth Science: allison.k.leidner@nasa.gov Planetary Science: lindsay.hays@nasa.gov Astrophysics: evan.scannapieco@nasa.gov Heliophysics: hakimzadeh@nasa.gov

Grant Program: ROSES 2019: Heliophysics System Observatory Connect

Agency: NASA NNH19ZDA001N-HSOC

Website: <https://nspires.nasaprs.com/external/solicitations/summary.do?solId=%7B1C50B1BF-52BA-7DD2-848D-13409588466F%7D&path=&method=init>

Brief Description: The goal of the Heliophysics System Observatory (HSO) Connect program is to enhance the scientific return of the HSO by supporting investigations that innovatively connect observations from one or more HSO missions with spacecraft or ground-based observations from other SMD Divisions, and/or other agencies within or outside the U.S. This instance of HSO-Connect focuses on observations from the Parker Solar Probe (PSP) mission together with other observations throughout the whole heliosphere. This includes data from currently operating space missions and ground-based observatories, and can include data from missions or observatories not yet launched or operational, but expected to be operational within the time interval of awards from this competition. In addition to PSP observations, investigations can include, but are not limited to, any HSO mission, but also Solar Orbiter, Bepi-Colombo, the Daniel K. Inouye Solar Telescope (DKIST) for example. In order to include observations not yet available, NASA Heliophysics is relaxing the requirement that all data must be in a public archive ahead of proposal submission (see Section 3.4.3 Limited Risk Waiver).

Awards: Various

Proposal Deadline: Step-1 proposals are due by January 15, 2020, and Step-2 proposals are due March 13, 2020.

Contact: Arik Posner, Heliophysics Division, Science Mission Directorate, Telephone: (202) 358 0727
Email: arik.posner@nasa.gov

National Endowment of Humanities

Grant Program: Institutes for Advanced Topics in the Digital Humanities

Agency: National Endowment for the Humanities 20200305-HT

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

Brief Description: The Institutes for Advanced Topics in the Digital Humanities (IATDH) program supports national or regional (multistate) training programs for scholars, humanities professionals, and advanced graduate students to broaden and extend their knowledge of digital humanities. Through this program NEH seeks to increase the number of humanities scholars and practitioners using digital technology in their research and to broadly disseminate knowledge about advanced technology tools and methodologies relevant to the humanities.

Applicants may apply to create institutes that are a single opportunity or are offered multiple times to different audiences. Institutes may be as short as a few days or as long as six weeks and held at a single site or at multiples sites; virtual institutes are also permissible. Training opportunities could be offered before or after regularly occurring scholarly meetings, during the summer months, or during appropriate times of the academic year. The duration of a program should allow for full and thorough treatment of the topic; it should also be appropriate for the intended audience.

Awards: Maximum award amount: \$250,000

Deadlines: Optional Draft Due: January 29, 2020

Application due: March 5, 2020

Contact: Contact the Office of Digital Humanities Team odh@neh.gov

Streamlyne Question of the Week

Question: Can I generate budgets for multiple years from the Year-1 budget in Streamlyne?

Answer: Yes! You only need to input the Year-1 budget and then click on the “generate all periods” button. Streamlyne will create budget sheets for the remaining periods. You can then go to “summary” under the budget tab to review budget sheets for all periods. You can also change specific budget items that you allocated in Year-1 but you do not want to continue them in the following periods.

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

Proposal Submission and Streamlyne Information

Internal Timeline for Successful and Timely Proposal Submission

Recently federal agencies including NSF, NIH and DoE/DoD have emphasized and requested Principal Investigators and institutions to submit their proposals well before the posted deadline to avoid unexpected problems in online submissions with respect to system error checks and additional needs of subsequent revisions. For example, NSF clearly stated during the CAREER program webinar held on May 9, 2019 posted on <https://www.nsf.gov/career> that any response from help desk within the last four days of the deadline may not be provided on the same day. NSF warned that the **questions related to errors and other proposal submission issues in the last 72 hours before the deadline may not be answered on time for submission.**

The NJIT Proposal Submission Guidelines and Policy posted on the website <https://research.njit.edu/research-policies> provides the institutional timeline in order to help faculty and staff Principal Investigators for successful proposal submission. We are requesting all Principal Investigators, faculty, staff and administration to follow the proposal submission to help everyone to submit a successful proposal on time, preferably before the deadline as requested by federal funding agencies. The following are the NJIT Proposal Submission Guidelines modified for Streamlyne proposal submission system:

- **1 month (or earlier) before the due date:** initiate the proposal submission process in Streamlyne with a notice of intent to apply to college POC and SRA including the request for proposal identification number (NSF, NIH) and/or the RFP document. This is an important step that will help the College POC and SRA to manage your proposals. It will allow:
 - preliminary review of needs and sponsor requirements (meeting recommended)
 - set up the timeline in motion and internal checklist/deadlines
 - collaborator outreach and intake requirements (where applicable)
 - set up the budget and Streamlyne document development process including any cost-sharing for consideration of department, college and office of research administration.
- **1 month - 2 weeks before due date:** the budget should be finalized and the approval process should be initiated. This includes the department and college approvals, conflict of interest forms, the detailed budget and justification, proposal title, and preliminary specific aims (NIH), proposal summary (NSF), or contract scope of work (SOW). The following checklist should be followed:
 - Proposal budget

- Internal budget commitments such as cost-sharing should be fully calculated/loaded at this time. Any college specific internal process for index source and approvals should be followed within this timeline.
 - Complete initial proposal details and internal Streamlyne information
 - Complete Streamlyne questionnaires
 - Proposal specific
 - Sponsor specific (as applicable for grants.gov for S2S submission)
 - Complete special review disclosures (as applicable)
 - IRB/human subjects
 - Biosafety
 - Animals
 - Export Controls
 - Conflict of Interest
- **2 weeks - 1 week before the due date:** submit all required internal attachments including:
 - Project Summary/Statement of Work
 - Final Budget
 - Budget Justification
 - For S2S Proposals – Complete additional input of placeholder attachments.
 - Submit in Streamlyne and monitor routing/review by key personnel and department/college administration.
- **72 hours – 24 hours before the submission deadline:** Prepare the final version for submission. The following actions will be managed during this period.
 - All final technical documents/attachments are completed and validated in internal and/or sponsor system(s).
 - Central Office completes final review and coordination with PI and College POC on final proposal review, validation of system requirements and engages in sponsor actions and submission.
 - Central office completes internal data and archiving procedures and coordinates follow-up
- **At least 24 hours before the submission deadline:** The PI should release the final version of the proposal to the SRA office at least 24 hours prior to the deadline for on-time submission.

For a successful submission, it is expected that faculty/PIs will follow up with the designated point-of-contact (ambassadors) for their college in a timely manner so that appropriate planning steps can be managed with respect to the proposal complexity, scope of support, any special needs such as cost-sharing, and multiple submission volume with the same due date. The following are the respective college point-of-contacts (ambassadors)

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

NCE: Deidra Slough, Grant Management Specialist, (973)-596-3428; deidra.l.slough@njit.edu

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

CSTR: Felicia Margolies, Project Manager, (973)-596-5377 felicia.h.margolies@njit.edu

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

HCoAD and MTSM: Interim POC: Justin Samolewicz, Director (Pre Award); (973)-596-3145;

justin.m.samolewicz@njit.edu; **Iris Pantoja**, Project Manager; 973-596-4483; irp3@njit.edu (on maternity leave)

NJII and T&BD: Bobby J. Vadasserril; (973)-596-2941; bobby.j.vadasserril@njit.edu

Faculty and staff having any questions on proposal submission, may contact their college point-of-contacts (ambassadors), and also follow up with **Justin Samolewicz, Director (Pre Award)** 973-596-3145; justin.m.samolewicz@njit.edu; and **Eric Hetherington**, Executive Director, Sponsored Research Programs Administration 973-596-3631; eric.d.hetherington@njit.edu as needed.

Streamlyne User Manuals: <http://www.njit.edu/research/streamlyne/>
New “How to Do” videos: <http://www5.njit.edu/research/streamlyne/>.

Streamlyne_NewUserManual_CommonElements.docx : This manual provides a reference to all the common elements of Streamlyne Research. This user manual is a good document to review each module’s functionality.

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

Need Information about Funding?

Finding Research Opportunities and Collaborations (FROC)

Walk-In Open-Hour Discussion with SVPR Over Tea

Every Thursday: 2.00 PM-3.00 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.
