

NJIT Research Newsletter

Issue: ORN-2019-37

NJIT Research Newsletter includes recent awards, and announcements of research related seminars, webinars, national and federal research news related to research funding, and **Grant Opportunity Alerts**. The Newsletter is posted on the NJIT Research Website <http://www.njit.edu/research/>.

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Special Announcements

Undergraduate Research and Innovation (URI) Information Session on Proposal Writing and Submission

URI Student Seed Grants: Fall 2019

URI Phase-1 Student Seed Grant: \$500 (per Project)

URI Phase-2 Student Seed Grant: \$3,000 (per Project)

URI Student Seed Grant Proposal Submission Deadline: October 8, 2019

URI Workshop Presentations:

October 23, 2019; 2.00 PM – 5.30 PM; Ballroom A, Campus Center

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

NJIT 2020 Vision strategic plan emphasizes providing undergraduate students an outstanding education with opportunities to have research and innovation experience as part of their NJIT learning enabling them to succeed and assume leadership roles in our society. The Undergraduate Research and Innovation (URI) program has evolved as a significant part of the education and research experience at NJIT. The URI website <http://centers.njit.edu/uri/> summarizes undergraduate research and innovation opportunities and provides information about resources and competitions.

We are pleased to announce the Undergraduate Research and Innovation Student Grant (URISG) program to provide students Phase-1 Student Seed Grants of \$500 per project to pursue preliminary research or demonstrate an initial proof-of-concept/prototypes. URI Phase-2 Student Seed Grants provides up to \$3,000 per project to pursue research further or develop a complete prototype. Funds can only be used to

order project supplies and prototyping through the Office of Undergraduate Research and Innovation. Phase-2 proposals may be submitted by former Phase-1 Student Seed Grant winners who have completed Phase-1 work, as well as new students who have a research or product idea that has shown the preliminary proof of concept, market assessment or application-based research to establish the need, significance and basic approach. The student may prepare URI Student Phase-1 or Phase-2 Seed Grant proposals following the templates with [format and guidelines](#). URI Seed Grants are awarded to the project as proposed by the student(s) team. The funding is not provided to individual students if there are more than one student working on the project. The project student leader and advisor are expected to manage the project for completion. When the project is completed, a written report should be submitted describing goals, design, results and other accomplishments and future plans within one month of the end of the funding period. More information about the program and submission guidelines are posted on the website <http://centers.njit.edu/uri/programs/index.php>

Grant Opportunity Alerts

Keywords and Areas Included in the Grant Opportunity Alert Section Below

NSF: IUSE / Professional Formation of Engineers: Revolutionizing Engineering Departments (IUSE/PFE: RED); Formal Methods in the Field (FMitF); Science of Science: Discovery, Communication, and Impact (SoS:DCI); Law & Science (LS); Science and Technology Studies (STS); Ethical and Responsible Research (ER2); Human Networks and Data Science - Infrastructure (HNDS-I); Mid-Scale Innovations Program in Astronomical Sciences (MSIP); Interfacial Engineering; Nanoscale Interactions; The Science of Learning and Augmented Intelligence Program (SL); Biosensing; Engineering of Biomedical Systems; Biophotonics; Disability and Rehabilitation Engineering (DARE); Particulate and Multiphase Processes; Environmental Engineering; Environmental Sustainability; Process Systems, Reaction Engineering, and Molecular Thermodynamics; Cellular and Biochemical Engineering; Combustion and Fire Systems; Fluid Dynamics; Secure and Trustworthy Cyberspace (SaTC); Improving Undergraduate STEM Education: Education and Human Resources (IUSE: EHR); Inclusion Across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (NSF INCLUDES); Security and Preparedness (SAP); EMERGING FRONTIERS IN RESEARCH AND INNOVATION (EFRI)

NIH: NIH Blueprint for Neuroscience Research Education Program on Translational Devices (R25); NIDCR Small Grant Program for New Investigators (R03); Trans-Agency Blood-Brain Interface Program (R61/R33); SBIR/STTR Commercialization Readiness Pilot (CRP) Program Technical Assistance (SB1, R44); Explainable Artificial Intelligence for Decoding and Modulating Neural Circuit Activity Linked to Behavior (R01); The NCI Predoctoral to Postdoctoral Fellow Transition Award (F99/K00)

Department of Defense/US Army/DARPA/ONR: Long Range Broad Agency Announcement (BAA) for Navy and Marine Corps Science & Technology; NRL Long Range Broad Agency Announcement (BAA) for Basic and Applied Research; DARPA Young Faculty Award; DSO Office-wide Broad Agency Announcement

Department of Transportation: Grants or Research Fellowship (GRF)

Department of Labor: Apprenticeships: Closing the Skills Gap

EPA: 2019 Healthy Communities Grant Program

Department of Energy: Performance-Based Energy Resource Feedback, Optimization, And Risk Management; Stewardship Science Academic Alliances (SSAA) Program; Marine Sciences Laboratory

NASA: Research Opportunities in Space and Earth Sciences: Astrophysics Science SmallSat Studies; NASA Space Technology Graduate Research Opportunities; Use of the NASA Physical Sciences

Informatics System; University Student Research Challenge; NASA Innovative Advanced Concepts (NIAC) Phase I; ROSES 2019: Living With a Star Science; Space Weather Science Applications Operations 2 Research

National Endowment of Humanities: Collaborative Research

ACI Foundation: Concrete Research Council (CRC) Awards

Recent Research Grant and Contract Awards

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

PI: Boris Khusid (PI)

Department: Chemical and Material Engineering

Grant/Contract Project Title: Advanced Colloids Experiment-Temperature and Gradient Control

Funding Agency: NASA

Duration: 09/01/19-08/31/21

PI: Hyojin Kim (PI)

Department: Hillier College of Architecture and Design

Grant/Contract Project Title: Field Toolkit and Methodology for Evaluating IEQ Performance of Historic Buildings for Sustainable and Effective

Funding Agency: U.S. Department of Interior (National Park Service)

Duration: 06/21/18-03/31/20

PI: Andrei Sirenko (PI)

Department: Physics

Grant/Contract Project Title: Non-Reciprocal Effects in Non-Centrosymmetric Magnets: Neutron and Optical Studies

Funding Agency: U.S. Department of Energy

Duration: 06/01/19-05/31/20

PI: Mengyan Li (PI)

Department: Chemistry and Environmental Sciences

Grant/Contract Project Title: Emergence and Attenuation of Wastewater-Stemmed PFAS in the Hudson River

Funding Agency: Hudson River Research Foundation

Duration: 09/01/19-08/31/20

In the News...

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

FY2020 Commerce, Justice, Science Appropriations Bill Approved for Senate Consideration: The Senate Committee on Appropriations [approved](#) the FY2020 Commerce, Justice, Science, and Related Agencies (CJS) Appropriations Act, which makes investments to support law enforcement, economic prosperity, scientific research, space exploration, and other national priorities. The \$70.833 billion measure is \$6.715 billion above the FY2019 enacted level and funds the U.S. Departments of Commerce

and Justice, the National Aeronautics and Space Administration, the National Science Foundation, and related agencies. The 30-0 [Appropriations Committee](#) vote would fund the National Science Foundation at \$8.3 billion, NASA at \$22.75 billion, the National Institute of Standards at \$1.04 billion, and the National Oceanic and Atmospheric Administration at \$5.337 billion.

Economic Development Administration (EDA) – \$319.5 million for EDA, an increase of \$15.5 million above the FY2019 enacted level. This includes \$119.5 million for its Public Works program, which supports brick-and-mortar projects in communities across the nation. Funding for EDA also includes \$31 million for the Regional Innovation Program, an increase of \$7.5 million above the FY2019 enacted amount, to promote and strengthen regional innovation to spur job creation through private-public partnerships.

U.S. Patent and Trademark Office (USPTO) – \$3.451 billion for USPTO to protect the ideas and inventions of our nation’s entrepreneurs in an effort to advance and innovate in all sectors of the economy.

National Institute of Standards and Technology (NIST) – \$1.04 billion for NIST, \$53 million above the FY2019 enacted level, to strengthen the U.S. cybersecurity posture through cutting-edge research and development, expand opportunities in the areas of advanced manufacturing, and continue promotion of the highest-quality standards to maintain fairness in the global marketplace. Funding for NIST includes a \$5.5 million increase for the Hollings Manufacturing Extension Partnership program, which is a private-public partnership present in all 50 states dedicated to serving small- and medium-sized manufacturers.

National Oceanic and Atmospheric Administration (NOAA) – \$5.337 billion for NOAA to continue core operations including: ocean monitoring; fisheries management; coastal grants to states; aquaculture research; and severe weather forecasting. Full funding is also provided for NOAA’s flagship weather satellites, which are critical for accurate weather warnings to save lives and protect property.

National Telecommunications and Information Administration (NTIA) – \$42.4 million for NTIA, an increase of \$2.9 million above the FY2019 enacted amount. Funds are included to enhance the National Broadband Map, to help provide better broadband access for underserved communities which will allow wider national participation and economic growth, and allow NTIA to perform cutting-edge telecommunications research and engineering.

National Aeronautics and Space Administration (NASA) – \$22.75 billion for NASA, \$1.25 billion above the FY2019 enacted level, reflecting the need to fund infrastructure for human spaceflight to support for the accelerated plan to return to the moon by 2024 while supporting NASA’s science, technology development, aeronautics, and education activities.

National Science Foundation (NSF) – \$8.317 billion for NSF, \$242 million above the FY2019 enacted level. Funding is provided for basic research across scientific disciplines to support the development of effective STEM programs.

- The bill provides \$249 million above the FY2019 level for research and \$27 million above FY2019 level for education activities. These funds will allow NSF to provide more grants to highly competitive research projects and help provide opportunities to prepare the next generation of STEM leaders.
- \$190 million is provided for EPSCoR, an increase of \$14 million above the FY2019 enacted level.

Quantum, AI, and Mid-Scale Infrastructure: The senators recommend "at least \$106 million for quantum information science research," and fully fund artificial intelligence "across NSF at the

request level." They also fulfill the request for mid-scale research instrumentation, encouraging at least one award in an Established Program to Stimulate Competitive Research (EPSCoR) state. Appropriators commend NIST for establishing the Quantum Economic Development Consortium and recommending giving the agency a \$10 million increase "to further implement the National Quantum Initiative Act." They also support university research aimed at overcoming barriers to high-volume additive manufacturing of metals, recognizing that "major technical barriers still exist."

Minority-Serving Institutions: The Senate bill would provide \$15 million for Historically Black Colleges and Universities [HBCUs] Excellence in Research program; \$35 million for the HBCU Undergraduate Program; \$46 million for the Louis Stokes Alliances for Minority Participation; \$40 million for Hispanic-serving institutions; and \$15 million for the Tribal Colleges and Universities Program. Another \$8 million would go to the Alliance for Graduate Education and the Professoriate; and \$24 million to Centers for Research Excellence in Science and Technology.

New Director for NSF Computer Information Science and Engineering: Princeton University computer science professor Margaret Martonosi will take over the Computer Information Science and Engineering directorate Feb. 1, 2020. She's currently leading a \$10 million NSF-funded multi-institution effort "to jump-start the development of quantum computing" and "attempt to reach goals in five years that were originally thought to be decades away," the university reported. According to [the March, 2018 abstract](#): "Quantum computing sits poised at the verge of a revolution. Quantum machines may soon be capable of performing calculations in machine learning, computer security, chemistry, and other fields that are extremely difficult or even impossible for today's computers." Among possibilities: better drug discovery, more efficient photovoltaics, new nanoscale materials, "and perhaps even more efficient food production." [See NSF's announcement on Martonosi.](#)

RED ALERT: NSF's Revolutionizing Engineering Departments program finds that while some innovation has been adopted in the freshman and senior years, "the middle two years remain largely untouched." The senior year ideal "has not yet been fully realized, because many of the competencies required in capstone design, or required of professional engineers, are only partially introduced in the first year and not carried forward with significant emphasis through the sophomore and junior years." In a new solicitation aimed at addressing this problem, RED anticipates making four to six awards, totalling up to \$8 million, on two tracks: RED Innovation projects and RED Adaptation and Implementation projects. [Learn more.](#)

Department of Energy AI Center: The Department of Energy's Artificial Intelligence and Technology Office "will accelerate the delivery of AI-enabled capabilities, scale the department-wide development and impact of AI, and synchronize AI activities to advance the agency's core missions, expand partnerships, and support American AI Leadership." The vision is to "Transform DOE into a world-leading AI enterprise by accelerating the research, development, delivery, and adoption of AI." More information with the specific areas is posted on the website <https://www.energy.gov/artificial-intelligence-and-technology-office>

Evolving Computers from Tools to Partners in Cyber-Physical System Design: Department of Defense (DOD) systems and platforms are composed of numerous integrated cyber-physical subsystems, which create an enormous amount of complexity and makes their engineering a daunting task. Today, designing cyber-physical systems (CPS) requires an army of skilled engineers with the right domain expertise, and hundreds of domain-specific tools. The process used to design these systems is largely

manual, creating long design cycles that often result in costly redesigns after building and testing the systems. The flaws in the process are numerous – from balancing predictability with cost-efficiency to operating under tight time constraints to integrating disparate pieces from multiple design teams. Further, teams are often limited to focusing on known design approaches, restricting their ability to create or identify more sophisticated system alternatives or innovative concepts. The Symbiotic Design program is a part of DARPA’s AI Next campaign – a multi-year, \$2 billion investment into new and existing programs focused on the development and application of “Third Wave” AI technologies. DARPA views the Third Wave of AI as the development of systems that are capable of acquiring new knowledge through generative contextual and explanatory models. In addition to developing the tools that will form the AI-enabled co-designer, the Symbiotic Design program seeks to create user-friendly interfaces to facilitate human-machine collaborations. Using automation technologies and human-machine interfaces, the program aims to make the design process accessible to more individuals by reducing the need for specialized skillsets, as well as augmenting the skills of experts. For research programs, please visit the DARPA website <https://www.darpa.mil/our-research>

Webinar and Events

Event: PAESMEM Applicant Webinars

Sponsor: NSF

When: October 10, 2019; 1.00 PM – 2.00 PM

Website: https://www.nsf.gov/events/event_summ.jsp?cntn_id=299251&org=NSF

Brief Description: NSF is offering a webinar on October 10, 2019 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: 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/>

December 19, 2019 2:00 PM to December 19, 2019 3:00 PM

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.

Limited Submission Grant Opportunities

Limited Submission Internal Competition for NSF PFI and MRI Programs

Grant Program: Partnerships for Innovation (PFI)

Agency: National Science Foundation NSF 19-506

RFP Website: <https://www.nsf.gov/pubs/2019/nsf19506/nsf19506.htm>

Brief Description: The Partnerships for Innovation (PFI) Program within the Division of Industrial Innovation and Partnerships (IIP) offers researchers from all disciplines of science and engineering funded by NSF the opportunity to perform translational research and technology development, catalyze partnerships and accelerate the transition of discoveries from the laboratory to the marketplace for societal benefit.

PFI has five broad goals, as set forth by the American Innovation and Competitiveness Act of 2017 (“the Act”, [S.3084 — 114th Congress](#); [Sec. 602. Translational Research Grants](#)): (1) identifying and supporting NSF-sponsored research and technologies that have the potential for accelerated commercialization; (2) supporting prior or current NSF-sponsored investigators, institutions of higher education, and non-profit organizations that partner with an institution of higher education in undertaking proof-of-concept work, including the development of technology prototypes that are derived from NSF-sponsored research and have potential market value; (3) promoting sustainable partnerships between NSF-funded institutions, industry, and other organizations within academia and the private sector with the purpose of accelerating the transfer of technology; (4) developing multi-disciplinary innovation ecosystems which involve and are responsive to the specific needs of academia and industry; (5) providing professional development, mentoring, and advice in entrepreneurship, project management, and technology and business development to innovators. This solicitation offers two broad tracks for proposals in pursuit of the aforementioned goals:

The **Technology Translation (PFI-TT) track** offers the opportunity to translate prior NSF-funded research results in any field of science or engineering into technological innovations with promising commercial potential and societal impact. PFI-TT supports commercial potential demonstration projects for academic research outputs in any NSF-funded science and engineering discipline. This demonstration is achieved through proof-of-concept, prototyping, technology development and/or scale-up work. Concurrently, students and postdoctoral researchers who participate in PFI-TT projects receive education and leadership training in innovation and entrepreneurship. Successful PFI-TT projects generate technology-driven commercialization outcomes that address societal needs.

The **Research Partnerships (PFI-RP) track** seeks to achieve the same goals as the PFI-TT track by supporting instead complex, multi-faceted technology development projects that are typically beyond the scope of a single researcher or institution and require a multi-organizational, interdisciplinary, synergistic collaboration. A PFI-RP project requires the creation of partnerships between academic researchers and third-party organizations such as industry, non-academic research organizations, federal laboratories, public or non-profit technology transfer organizations or other universities. Such partnerships are needed to conduct applied research on a stand-alone larger project toward commercialization and societal impact. In the absence of such synergistic partnership, the project’s likelihood for success would be minimal.

The intended outcomes of both PFI-TT and PFI-RP tracks are: a) the commercialization of new intellectual property derived from NSF-funded research outputs; b) the creation of new or broader collaborations with industry (including increased corporate sponsored research); c) the licensing of NSF-funded research outputs to third party corporations or to start-up companies funded by a PFI team; and d) the training of future innovation and entrepreneurship leaders.

Limit on Number of Proposals per Organization: There is no limit on the number of PFI-TT proposals an organization may submit to a deadline of this solicitation. However, an organization may not submit more than one (1) new or resubmitted PFI-RP proposal to a deadline of this solicitation. This eligibility constraint will be strictly enforced. If an organization exceeds this limit, the first PFI-RP proposal received will be accepted, and the remainder will be returned without review. An organization may not receive more than two (2) awards from a submission deadline of this solicitation.

Internal Competition: If you are interested in submitting PFI-RP track proposal, please submit a pre-proposal to your college dean by October 15, 2019 using the following format. Each college dean is requested to forward maximum one pre-proposal with college recommendation to Atam Dhawan, SVPR by **October 28, 2019**. The selection of one institutional PFI-RP proposal will be announced by November 1, 2019. Institutional pre-proposal should follow the following format:

1. Cover Page: Title and list of all key investigators (including collaborators) with their affiliations and roles
2. Project Summary (max 1 page)
3. Intellectual Merit and Broader Impact (max 1 page)
4. Project Description: Significance, Innovation, Approach and Partnership with Management Plan (max 3 pages)
5. Budget including subcontracts
6. NSF format Biosketch for PI and Co-PIs

Awards: Standard Grants. Anticipated Funding: \$20,000,000; Number of Awards: 55-65

Letter of Intent: Not Required

Proposal Submission Deadline: January 08, 2020

Contacts: Jesus V. Soriano, telephone: (703) 292-7795, email: jsoriano@nsf.gov

Grant Program: NSF Major Research Instrumentation Program: (MRI)

Agency: National Science Foundation NSF 18-513

RFP Website: <https://www.nsf.gov/pubs/2018/nsf18513/nsf18513.htm>

Brief Description: The Major Research Instrumentation (MRI) Program serves to increase access to multi-user scientific and engineering instrumentation for research and research training in our Nation's institutions of higher education and not-for-profit scientific/engineering research organizations. An MRI award supports the acquisition or development of a multi-user research instrument that is, in general, too costly and/or not appropriate for support through other NSF programs.

MRI provides support to acquire critical research instrumentation without which advances in fundamental science and engineering research may not otherwise occur. MRI also provides support to develop next-generation research instruments that open new opportunities to advance the frontiers in science and engineering research. Additionally, an MRI award is expected to enhance research training of students who will become the next generation of instrument users, designers and builders.

An MRI proposal may request up to \$4 million for either acquisition or development of a research instrument. Beginning with the FY 2018 competition, each performing organization may submit in *revised* "Tracks" as defined below, *with no more than two submissions in Track 1 and no more than one submission in Track 2*.

- Track 1: Track 1 MRI proposals are those that request funds from NSF greater than or equal to \$100,000¹ and less than \$1,000,000.
- Track 2: Track 2 MRI proposals are those that request funds from NSF greater than or equal to \$1,000,000 up to and including \$4,000,000.

Consistent with the America COMPETES Act of 2007 (Public Law 110-69), cost sharing of precisely 30% of the total project cost is required for Ph.D.-granting institutions of higher education and for non-degree-granting organizations. Non-Ph.D.-granting institutions of higher education are exempt from the cost-sharing requirement and cannot include it. National Science Board policy prohibits voluntary committed cost sharing.

Please see the solicitation text for organizational definitions used by the MRI program.

The MRI Program especially seeks broad representation of PIs in its award portfolio, including women, underrepresented minorities and persons with disabilities. Since demographic diversity may be greater

among early-career researchers the MRI program also encourages proposals with early-career PIs and proposals that benefit early-career researchers.

Awards Range: \$100,000-\$4 million; **Anticipated Funding Amount:** \$75,000,000

Letter of Intent: Not Required

Submission Deadline: January 01, 2020 - January 19, 2020

Limit on Number of Proposals per Organization:

Three (3) as described below. Potential PIs are advised to contact their institutional office of research regarding processes used to select proposals for submission.

The MRI program requires that an MRI-eligible organization may, as a performing organization, submit or be included as a significantly funded [\[3\]](#) subawardee in no more than three MRI proposals. Beginning with this competition, each performing organization is now limited to a maximum of three proposals in *revised* “Tracks” as defined below, with no more than two submissions in Track 1 and no more than one submission in Track 2. Any MRI proposal may request support for either the acquisition or development of a research instrument. Within their submission limit, NSF strongly encourages organizations to submit proposals for innovative development projects.

Any MRI proposal may request support for either the acquisition or development of a research instrument.

- Track 1: Track 1 MRI proposals are those that request funds from NSF greater than or equal to \$100,000¹ and less than \$1,000,000.
- Track 2: Track 2 MRI proposals are those that request funds from NSF greater than or equal to \$1,000,000 up to and including \$4,000,000.

Note: The 30% cost-sharing requirement applies to only the portion of the total project cost budgeted to non-exempt organizations, including those participating through subawards. When required, cost-sharing must be precisely 30%. Cost sharing is required for Ph.D.-granting institutions of higher education and for non-degree-granting organizations. Non-Ph.D.-granting institutions of higher education are exempt from cost-sharing and cannot provide it. National Science Board policy is that voluntary committed cost sharing is prohibited. See section V.B. for specific information on cost-sharing calculations and the solicitation text for definitions of organizational types used for the MRI program.

[3] An unfunded collaboration does not count against the submission limit. Inclusion as a funded subawardee on a development proposal at a level in excess of 20% of the total budget requested from NSF, or as a funded subawardee, when allowed, on any acquisition proposal, will be counted against an organization's proposal submission limit. Separately submitted linked collaborative proposals count against the submission limit of each of the submitting organizations. However, if a subaward to an organization in a *development proposal* is 20% or less of the proposal's total budget request from NSF, the subawardee's submission limit will not be affected. For subawards within a linked collaborative proposal, the 20% threshold applies to the budget request from NSF in the proposal containing the subaward(s), not to the combined budget request from NSF for the collaborative project.

Internal Competition Deadline to College Dean's Office: November 1, 2019: Please submit up to 5 pages pre-proposal white paper to your respective Dean by November 1, 2019 in the following format. College level reviews will be conducted by Deans to forward recommendations for up to 2 proposals to the Office of Research and Development by November 7, 2019. The final selection will be announced by November 15, 2019. The following format for the pre-proposal is suggested which is consistent with actual proposal guidelines and review criterion:

1. Cover Sheet (not counted in the page limit):
 - a. Title of the project proposal
 - b. Track Type: I or II
 - c. PI name and affiliation and contact information
 - d. Co-PIs name and affiliation
 - e. Additional users or any consortium information, if applicable

f. Date submitted to College Dean

2. Project Summary

Each proposal must contain a summary of the proposed project not more than one page in length. The Project Summary consists of an overview, a statement on the intellectual merit of the proposed activity, and a statement on the broader impacts of the proposed activity.

3. Proposal Description covering the subsections (a)-(e) as posted on the previous RFP on <https://www.nsf.gov/pubs/2018/nsf18513/nsf18513.htm> with the section:

(a) **a1. Instrument Location and Type**

a2. ONLY REQUIRED FOR DEVELOPMENT PROPOSALS: Justification for submission as a Development proposal

(b) Research Activities to be Enabled

(c) Description of the Research Instrumentation and Needs

(d) Broader Impacts (Including Impact on Research and Training Infrastructure)

(e) Management Plan

4. Preliminary Budget and Budget Justification; and Required Cost-Sharing

5. Brief biographical sketch of PI with a brief description of current and previous accomplishments.

For pre-proposal review, the NSF MRI proposal review criterion may be used to help faculty receive some feedback on their proposals that may be helpful for their final or future proposal submissions. The merit review criterion as posted on the RFP is:

- **Intellectual Merit:** The Intellectual Merit criterion encompasses the potential to advance knowledge; and
- **Broader Impacts:** The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes

Instrument Acquisition Proposals.

- The extent to which the instrument is used for multi-user, shared-use research and/or research training.
- Whether the management plan demonstrates sufficient commitment and technical expertise for effective scheduling and usage of the instrument.
- The organization's commitment to ensuring successful operations and maintenance over the expected lifetime of the instrument.
- Whether the research to be enabled is compelling and justifies the instrument request.
- Whether the budget request is appropriate and well justified.
- if student involvement is in the form of direct support for operations and maintenance of the instrument, reviewers will be asked to evaluate the involvement in terms of both instrument needs and the training of the next generation of instrumentalists.
- For instrument acquisition proposals of \$1 million or above, the potential impact of the instrument on the research community of interest at the regional or national level, if appropriate.

Instrument Development Proposals:

- The appropriateness of submission as a development proposal.
- The need for development of a new instrument. Will the proposed instrument enable enhanced performance over existing instruments, or new types of measurement or information gathering? Is there a strong need for the new instrument in the larger user community to advance new frontiers of research?
- The adequacy of the project's management plan. Does the plan have a realistic schedule that is described in sufficient detail to be assessed? Are mechanisms described to mitigate and deal with potential risks?
- The availability of appropriate technical expertise to design and construct the instrument. If direct support for student involvement in development efforts is requested, reviewers will be asked to

evaluate the involvement in terms of both project needs and training the next generation of instrumentalists.

- The appropriateness of the cost of the new technology.

National Science Foundation

Grant Program: IUSE / Professional Formation of Engineers: Revolutionizing Engineering Departments (IUSE/PFE: RED)

Agency: National Science Foundation NSF 19-614

RFP Website: <https://www.nsf.gov/pubs/2019/nsf19614/nsf19614.htm>

Brief Description: Revolutionizing Engineering Departments (hereinafter referred to as RED) is designed to build upon previous efforts in engineering education research. Specifically, previous and ongoing evaluations of the NSF Engineering Education and Centers Division program and its predecessors, as well as those related programs in the Directorate of Education and Human Resources, have shown that prior investments have significantly improved the first year of engineering students' experiences, incorporating engineering material, active learning approaches, design instruction, and a broad introduction to professional skills and a sense of professional practice – giving students an idea of what it means to become an engineer. Similarly, the senior year has seen notable change through capstone design experiences, which ask students to synthesize the technical knowledge, skills, and abilities they have gained with professional capacities, using reflective judgment to make decisions and communicate these effectively. However, this ideal of the senior year has not yet been fully realized, because many of the competencies required in capstone design, or required of professional engineers, are only partially introduced in the first year and not carried forward with significant emphasis through the sophomore and junior years.

The Directorates for Engineering (ENG), Education and Human Resources (EHR), and Computer and Information Science and Engineering (CISE) have funded projects as part of the RED program, in alignment with the Improving Undergraduate STEM Education (IUSE) framework and Professional Formation of Engineers (PFE) initiative. These projects are designing revolutionary new approaches to engineering and computer science education, ranging from changing the canon of engineering to fundamentally altering the way courses are structured to creating new departmental structures and educational collaborations with industry. A common thread across these projects is a focus on organizational and cultural change within the departments, involving students, faculty, staff, and industry in rethinking what it means to provide an engineering program.

In order to continue to catalyze revolutionary approaches, while expanding the reach of those that have proved efficacious in particular contexts, the RED program supports two tracks: RED Innovation and RED Adaptation and Implementation (RED-A&I). RED Innovation projects will develop new, revolutionary approaches and change strategies that enable the transformation of undergraduate engineering education. RED Adaptation and Implementation projects will adapt and implement evidence-based organizational change strategies and actions to the local context, which helps propagate this transformation of undergraduate engineering education. Projects in both tracks will include consideration of the cultural, organizational, structural, and pedagogical changes needed to transform the department to one in which students are engaged, develop their technical and professional skills, and establish identities as professional engineers. The focus of projects in both tracks should be on the department's disciplinary courses and program.

Awards: Standard grants Anticipated Funding Amount: \$4,000,000 to \$8,000,000

Letter of Intent: Not Required

Proposal Submission Deadline: February 07, 2020

Limit on Number of Proposals per Organization: 2

An eligible institution may submit a maximum of two proposals (i.e. 2 Innovation Track, 2 A&I Track, or 1 Innovation and 1 A&I).

Notification: Since this is a limited submission opportunity, if you would like to submit a proposal, please notify SVP Atam Dhawan (dhawan@njit.edu) by November 1, 2019. If there will be more than 2 requests, an internal review of the summary of the proposal requests will be pursued in order to select 2 institutional proposal submissions.

Contacts: Edward Berger, telephone: (703)292-7708, email: eberger@nsf.gov

- Heather Watson, telephone: (703) 292-7091, email: hwatson@nsf.gov

Grant Program: Formal Methods in the Field (FMitF)

Agency: National Science Foundation NSF 19-613

RFP Website: <https://www.nsf.gov/pubs/2019/nsf19613/nsf19613.htm>

Brief Description: The Formal Methods in the Field (FMitF) program aims to bring together researchers in formal methods with researchers in other areas of computer and information science and engineering to jointly develop rigorous and reproducible methodologies for designing and implementing correct-by-construction systems and applications with provable guarantees. FMitF encourages close collaboration between two groups of researchers. The first group consists of researchers in the area of formal methods, which, for the purposes of this solicitation, is broadly defined as principled approaches based on mathematics and logic, including modeling, specification, design, program analysis, verification, synthesis, and programming language-based approaches. The second group consists of researchers in the “field,” which, for the purposes of this solicitation, is defined as a subset of areas within computer and information science and engineering that currently do not benefit from having established communities already developing and applying formal methods in their research. This solicitation limits the field to the following areas that stand to directly benefit from a grounding in formal methods: computer networks, cyber-human systems, distributed /operating systems, embedded systems, and machine learning. Other field(s) may emerge as priority areas for the program in future years, subject to the availability of funds. The FMitF program solicits two classes of proposals:

Track I: Research proposals: Each proposal must have at least one Principal Investigator (PI) or co-PI with expertise in formal methods and at least one with expertise in one or more of these fields: computer networks, cyber-human systems, distributed/operating systems, embedded systems, and machine learning. Proposals are expected to address the fundamental contributions to both formal methods and the respective field(s) and should include a proof of concept in the field along with a detailed evaluation plan that discusses intended scope of applicability, trade-offs, and limitations. All proposals are expected to contain a detailed collaboration plan that clearly highlights and justifies the complementary expertise of the PIs/co-PIs in the designated areas and describes the mechanisms for continuous bi-directional interaction. Projects are limited to \$750,000 in total budget, with durations of up to four years.

Track II: Transition to Practice (TTP) proposals: The objective of this track is to support the ongoing development of extensible and robust formal methods research prototypes/tools to facilitate usability and accessibility to a larger and more diverse community of users. These proposals are expected to support the development, implementation, and deployment of later-stage successful formal methods research and tools into operational environments in order to bridge the gap between research and practice. A TTP proposal must include a project plan that addresses major tasks and system development milestones as well as an evaluation plan for the working system. Proposals are expected to identify a target user community or organization that will serve as an early adopter of the technology. Collaborations with industry are strongly encouraged. Projects are limited to \$100,000 in total budget, with durations of up to 18 months.

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

Letter of Intent: Not Required

Proposal Submission Deadline: January 22, 2020

Contacts: Nina Amla, Program Director, CISE/CCF, telephone: (703) 292-7991, email: namla@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: Science of Science: Discovery, Communication, and Impact (SoS:DCI)

Agency: National Science Foundation NSF PD 19-125Y

RFP Website:

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505730&org=NSF&sel_org=NSF&from=fund

Brief Description: The Science of Science: Discovery, Communication, and Impact (SoS:DCI) program is designed to increase the public value of scientific activity. The program pursues this goal by supporting basic research in three fundamental areas:

How to increase the rate of socially beneficial discovery;

How to improve science communication outcomes; and

How to expand the societal benefits of scientific activity.

The SoS:DCI program, which builds upon the former Science of Science & Innovation Policy (SciSIP) program, funds research that builds theoretical and empirical understandings of these three areas. With this goal in mind, proposals should:

Develop data, models, indicators, and associated analytical tools that constitute and enable transformative advances rather than incremental change.

Identify ethical challenges and mitigate potential risks to people and institutions.

Provide credible metrics and rigorous assessments of their proposed project's impact.

Include robust data management plans with the goal to increase the usability, validity, and reliability of scientific materials. See PAPPG Chapter II.C.2.j and Data Management for NSF SBE Directorate Proposals and Awards for additional information (https://www.nsf.gov/sbe/DMP/SBE_DataMgmtPlanPolicy_RevisedApril2018.pdf).

The SoS:DCI program places a high priority on broadening participation. It encourages leadership from junior faculty, women, members of historically underrepresented groups, and proposals from Minority Serving Institutions (MSIs), Research Undergraduate Institutions (RUIs), and EPSCoR states.

Awards: Standard grants including Grants for Rapid Response Research (RAPID) and EARly-concept Grants for Exploratory Research (EAGER), Grant Opportunities for Academic Liaison with Industry (GOALI) and Conferences, Workshops, and Supplements

Letter of Intent: Not Required

Proposal Submission Deadline: February 10, 2020

Contacts: Cassidy R. Sugimoto-Program Director csugimot@nsf.gov 703-292-7012 C13025

Marvee Shah-Program Specialist mashah@nsf.gov (703) 292-8700 C13015B

Grant Program: Law & Science (LS)

Agency: National Science Foundation NSF 19-612

RFP Website: <https://www.nsf.gov/pubs/2019/nsf19612/nsf19612.htm>

Brief Description: The Law & Science Program considers proposals that address social scientific studies of law and law-like systems of rules, as well as studies of how science and technology are applied in legal contexts. The Program is inherently interdisciplinary and multi-methodological. Successful proposals

describe research that advances scientific theory and understanding of the connections between human behavior and law, legal institutions, or legal processes; or the interactions of law and basic sciences, including biology, computer and information sciences, STEM education, engineering, geosciences, and math and physical sciences. Scientific studies of law often approach law as dynamic, interacting with multiple arenas, and with the participation of multiple actors. Fields of study include many disciplines, and often address problems including, though not limited, to:

Crime, Violence, and Policing

Cyberspace

Economic Issues

Environmental Science

Evidentiary Issues

Forensic Science

Governance and Courts

Human Rights and Comparative Law

Information Technology

Legal and Ethical Issues related to Science

Legal Decision Making

Legal Mobilization and Conceptions of Justice

Litigation and the Legal Profession

Punishment and Corrections

Regulation and Facilitation of Biotechnology (e.g., Gene Editing, Gene Testing, Synthetic Biology) and Other Emerging Sciences and Technologies

Use of Science in the Legal Processes

Awards: Standard Grant or Continuing Grant; Anticipated Funding Amount: \$5,500,000

LS supports the following types of proposals:

- Standard Research Grants and Grants for Collaborative Research
- Doctoral Dissertation Research Improvement Grants
- Conference Awards

LS also participates in a number of specialized funding opportunities through NSF's cross-cutting and cross-directorate activities, including, for example:

- Faculty Early Career Development (CAREER) Program
- Research Experiences for Undergraduates (REU)
- Research at Undergraduate Institutions (RUI)
- Grants for Rapid Response Research (RAPID)
- Early-concept Grants for Exploratory Research (EAGER)

Letter of Intent: Not Required

Proposal Submission Deadline: January 15, 2020

Contacts: Reginald S. Sheehan - Program Director, telephone: (703) 292-5389, email: rsheehan@nsf.gov

Brian H. Bornstein - Program Director, telephone: (703) 292 8760, email: bbornste@nsf.gov

Grant Program: Science and Technology Studies (STS)

Agency: National Science Foundation NSF 19-610

RFP Website: <https://www.nsf.gov/pubs/2019/nsf19610/nsf19610.htm>

Brief Description: The Science and Technology Studies (STS) program supports research that uses historical, philosophical, and social scientific methods to investigate the intellectual, material, and social facets of the scientific, technological, engineering and mathematical (STEM) disciplines. It encompasses a broad spectrum of topics including interdisciplinary studies of ethics, equity, governance, and policy issues that are closely related to STEM disciplines.

The program's review process is approximately six months. It includes appraisal of proposals by ad hoc reviewers selected for their expertise and by an advisory panel that meets twice a year. The deadlines for the submission of proposals are February 2nd for proposals to be funded as early as July, and August 3rd for proposals to be funded in or after January. There is one exception: Doctoral Dissertation Improvement Grant proposals will have only one deadline per year, August 3rd.

The Program encourages potential investigators with questions about the program to contact one of the Cognizant Program Directors. Potential investigators who have concerns about whether their proposal fits the goals of the program are encouraged to send a one-page prospectus of their proposal idea to the Cognizant Program Directors. Guidelines for developing one-page prospectuses are provided below under Guidelines for Developing Effective STS Proposals.

Awards: Standard grants; Anticipated Funding Amount: \$6,200,000

Letter of Intent: Not Required

Proposal Submission Deadline: February 03, 2020

Contacts: Frederick M. Kronz-Program Director, telephone: (703) 292-7283, email: fkronz@nsf.gov

- John N. Parker-Program Director, telephone: (703) 292-5034, email: joparker@nsf.gov
-

Grant Program: Ethical and Responsible Research (ER2)

Agency: National Science Foundation NSF 19-609

RFP Website: <https://www.nsf.gov/pubs/2019/nsf19609/nsf19609.htm>

Brief Description: Ethical and Responsible Research (ER2) funds research projects that identify (1) factors that are effective in the formation of ethical STEM researchers and (2) approaches to developing those factors in all STEM fields that NSF supports. ER2 solicits proposals for research that explores the following: "What constitutes responsible conduct for research (RCR), and which cultural and institutional contexts promote ethical STEM research and practice and why?" Do certain labs have a "culture of academic integrity"? What practices contribute to the establishment and maintenance of ethical cultures and how can these practices be transferred, extended to, and integrated into other research and learning settings?" Factors one might consider include: honor codes, professional ethics codes and licensing requirements, an ethic of service and/or service learning, life-long learning requirements, curricula or memberships in organizations (e.g. Engineers without Borders) that stress responsible conduct for research, institutions that serve under-represented groups, institutions where academic and research integrity are cultivated at multiple levels, institutions that cultivate ethics across the curriculum, or programs that promote group work, or do not grade. Successful proposals typically have a comparative dimension, either between or within institutional settings that differ along these or among other factors, and they specify plans for developing interventions that promote the effectiveness of identified factors. ER2 research projects will use basic research to produce knowledge about what constitutes or promotes responsible or irresponsible conduct of research, and how to best instill this knowledge into researchers and educators at all career stages. In some cases, projects will include the development of interventions to ensure ethical and responsible research conduct.

Awards: Standard grants; Anticipated Funding Amount: \$3,550,000

Letter of Intent: Not Required

Proposal Submission Deadline: February 24, 2020

Contacts: John N. Parker (SBE), telephone: (703) 292-5034, email: joparker@nsf.gov

- Frederick M. Kronz (SBE), telephone: (703) 292-7283, email: fkronz@nsf.gov
 - Cassandra M. Dudka (OISE), telephone: (703) 292-7250, email: cdudka@nsf.gov
-

Grant Program: Human Networks and Data Science - Infrastructure (HNDS-I)

Agency: National Science Foundation NSF 19-608

RFP Website: <https://www.nsf.gov/pubs/2019/nsf19608/nsf19608.htm>

Brief Description: Human Networks and Data Science (HNDS) is a two-track program. It supports research and infrastructure that uses data science to advance understanding of a full range of human networks. HNDS research will identify ways in which dynamic, distributed, and heterogeneous data can provide novel answers to fundamental questions about individual and group behavior. HNDS is especially interested in proposals that leverage data-rich insights about human networks to support improved health, prosperity, and security. HNDS has two components:

Human Networks and Data Science – Infrastructure (HNDS-I). Development of data resources and relevant analytic techniques that support fundamental SBE research in the context of human networks. For FY 2020, this research is funded through this solicitation, which replaces the previous Resource Implementations for Data Intensive Research in the Social, Behavioral and Economic Sciences (RIDIR) solicitation.

Human Networks and Data Science – Core Research (HNDS-R). Core research proposals use data science to generate novel understandings of human networks – particularly understandings that can improve the outcomes of significant societal opportunities and challenges. HNDS encourages core research proposals that make innovative use of HNDS infrastructure (formerly RIDIR).

Awards: Standard grants; Anticipated Funding Amount: \$4,500,000

Letter of Intent: Not Required

Proposal Submission Deadline: February 24, 2020

Contacts: ohn E. Yellen, telephone: (703) 292-8759, email: jyellen@nsf.gov

Joseph M. Whitmeyer, telephone: (703) 292-7808, email: jwhitmey@nsf.gov

Grant Program: Mid-Scale Innovations Program in Astronomical Sciences (MSIP)

Agency: National Science Foundation NSF 19-605

RFP Website: <https://www.nsf.gov/pubs/2019/nsf19605/nsf19605.htm>

Brief Description: A vigorous Mid-Scale Innovations Program (MSIP) was recommended by the 2010 Astronomy and Astrophysics Decadal Survey, citing "many highly promising projects for achieving diverse and timely science." As described in this solicitation, the Division of Astronomical Sciences conducts a mid-scale program to support a variety of astronomical activities within a cost range up to \$30M. This program is formally divided into four subcategories: 1) limited term, self-contained science projects; 2) longer term mid-scale facilities; 3) development investments for future mid-scale and large-scale projects; and 4) community open access capabilities. MSIP will emphasize both strong scientific merit and a well-developed plan for student training and involvement of a diverse workforce in instrumentation, facility development, or data management.

Awards: Standard grants; Anticipated Funding Amount: \$4,000,000 to \$30,000,000

Letter of Intent: Not Required

Proposal Submission Deadline: Full Proposal Accepted Anytime

Limit on Number of Proposals per Organization: 3

A single organization may submit a maximum of three preliminary proposals as the lead institution. Full proposals are to be submitted only when invited by NSF, and no more than two invitations will be issued to a single organization. There is no limit to participation as a partner institution.

Contacts: Richard E. Barvainis, W 9134, telephone: (703) 292-4891, email: rbarvai@nsf.gov

Grant Program: Interfacial Engineering

Agency: National Science Foundation NSF PD 20-1417

RFP Website:

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505726&org=NSF&sel_org=NSF&from=fund

Brief Description: The **Interfacial Engineering** program is part of the Chemical Process Systems cluster, which also includes: 1) the **Catalysis** program; 2) the **Electrochemical Systems** program; and 3) the **Process Systems, Reaction Engineering, and Molecular Thermodynamics** program.

The goal of the **Interfacial Engineering** program is to support fundamental research on atomic- and molecular-scale interfacial phenomena and engineering of interfacial properties, processes, and materials. Fundamental understanding of the thermodynamic, kinetic, and transport properties of interfacial systems underpins improvements in chemical process efficiency and resource utilization. As such, proposed research should have a clear vision for how the results will translate to practice in or otherwise advance industrial chemical or biochemical processes. The program encourages proposals that present new approaches to long-standing challenges or address emerging research areas and technologies. Collaborative and interdisciplinary proposals are also encouraged, particularly those that involve a combination of experiment with theory or modeling.

Major research areas of interest in the program include:

- **Chemical separations:** Design of scalable mass separating agents (for example, sorbents and membranes); field-induced separation processes that target a significant reduction in energy and/or materials requirements.

- **Biological separations:** Downstream processing of biologically-derived chemicals, therapeutic proteins, and biologics for increased throughput and purity; engineering interfaces for molecular recognition.

- **Interfacial phenomena at engineered interfaces and surfaces:** Kinetics and thermodynamics of adsorption/desorption and complex interactions of molecules and ions at engineered interfaces and surfaces (for example, adsorption and nucleation).

- **Nanoconfinement and engineered surfaces:** Theory, modeling, and/or approaches for examining transport and thermodynamic properties of fluids within nanopores, under nanoconfinement, or at highly engineered surfaces.

Innovative proposals outside of these specific interest areas may be considered. However, prior to submission, it is recommended that the PI contact the Program Director to avoid the possibility of the proposal being returned without review.

Awards: Standard grants including Faculty Early Career Development (CAREER), Grants for Rapid Response Research (RAPID) and EARly-concept Grants for Exploratory Research (EAGER), Grant Opportunities for Academic Liaison with Industry (GOALI) and Conferences, Workshops, and Supplements

Letter of Intent: Not Required

Proposal Submission Deadline: Full Proposal Accepted Anytime

Contacts: Christina Payne cpayne@nsf.gov (703) 292-2895

Catherine Walker cawalker@nsf.gov (703) 292-7125

Grant Program: Nanoscale Interactions

Agency: National Science Foundation NSF PD 20-1179

RFP Website:

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505696&org=NSF&sel_org=NSF&from=fund

Brief Description: The Nanoscale Interactions program is part of the Environmental Engineering and Sustainability cluster, which also includes: 1) the Environmental Engineering program; and 2) the Environmental Sustainability program. The goal of the Nanoscale Interactions program is to support research to advance fundamental and quantitative understanding of the interactions of nanomaterials and nanosystems with biological and environmental media.

Materials of interest include one- to three-dimensional nanostructures, heterogeneous nano-bio hybrid assemblies, dendritic and micelle structures, quantum dots, and other nanoparticles. Such

nanomaterials and systems frequently exhibit novel physical, chemical, photonic, electronic, and biological behavior as compared to the bulk scale. Collaborative and interdisciplinary proposals are encouraged.

Research areas supported by the program include:

- Characterization of interactions at the interfaces of nanomaterials and nanosystems, including both simple nanoparticles and complex and/or heterogeneous composites and nanosystems, with surrounding biological and environmental media;
- Development of predictive tools based on the fundamental behavior of nanostructures to advance cost-effective and environmentally benign processing and engineering solutions over full-life material cycles;
- Examination of the transport, interaction, and impact of nanostructured materials and nanosystems on biological systems and the environment; and
- Simulations of nanoparticle behavior at interfaces, in conjunction with experimental comparisons, and new theories and simulation approaches for determining the transport and transformation of nanoparticles in various media.
- Research in these areas will enable the design of nanostructured materials and heterogeneous nanosystems with desired chemical, electronic, photonic, biological, and mechanical properties for optimal and sustainable handling, manufacture, and utilization.

Awards: Standard grants including Faculty Early Career Development (CAREER), Grants for Rapid Response Research (RAPID) and EARly-concept Grants for Exploratory Research (EAGER), Grant Opportunities for Academic Liaison with Industry (GOALI) and Conferences, Workshops, and Supplements

Letter of Intent: Not Required

Proposal Submission Deadline: Full Proposal Accepted Anytime

Contacts: Nora F. Savage NOSAVAGE@nsf.gov (703) 292-7949

Brandi Schottel bschotte@nsf.gov (703) 292-4798

Grant Program: The Science of Learning and Augmented Intelligence Program (SL)

Agency: National Science Foundation NSF PD 19-127Y

RFP Website:

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505731&org=NSF&sel_org=NSF&from=fund

Brief Description: The Science of Learning and Augmented Intelligence Program (SL) supports potentially transformative research that develops basic theoretical insights and fundamental knowledge about principles, processes and mechanisms of learning, and about augmented intelligence - how human cognitive function can be augmented through interactions with others, contextual variations, and technological advances.

The program supports research addressing learning in individuals and in groups, across a wide range of domains at one or more levels of analysis including: molecular/cellular mechanisms; brain systems; cognitive, affective, and behavioral processes; and social/cultural influences.

The program also supports research on augmented intelligence that clearly articulates principled ways in which human approaches to learning and related processes, such as in design, complex decision-making and problem-solving, can be improved through interactions with others, and/or the use of artificial intelligence in technology. These could include ways of using knowledge about human functioning to improve the design of collaborative technologies that have capabilities to learn to adapt to humans.

For both aspects of the program, there is special interest in collaborative and collective models of learning and/or intelligence that are supported by the unprecedented speed and scale of technological connectivity. This includes emphasis on how people and technology working together in new ways and

at scale can achieve more than either can attain alone. The program also seeks explanations for how the emergent intelligence of groups, organizations, and networks intersects with processes of learning, behavior and cognition in individuals.

Projects that are convergent and/or interdisciplinary may be especially valuable in advancing basic understanding of these areas, but research within a single discipline or methodology is also appropriate. Connections between proposed research and specific technological, educational, and workforce applications will be considered as valuable broader impacts but are not necessarily central to the intellectual merit of proposed research. The program supports a variety of approaches including: experiments, field studies, surveys, computational modeling, and artificial intelligence/machine learning.

Awards: Standard grants

Letter of Intent: Not Required

Proposal Submission Deadline: January 15, 2020

Contacts: Soo-Siang Lim slim@nsf.gov (703) 292-7878 W13128
Cori J. Jacildone cjacildo@nsf.gov (703) 292-8740 W13137B

Grant Program: Biosensing

Agency: National Science Foundation NSF PD 20-7909

RFP Website:

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505720&org=NSF&sel_org=NSF&from=fund

Brief Description: The **Biosensing** program is part of the Engineering Biology and Health cluster, which also includes 1) the **Biophotonics** program; 2) the **Cellular and Biochemical Engineering** program; 3) the **Disability and Rehabilitation Engineering** program; and 4) the **Engineering of Biomedical Systems** program. The **Biosensing** program supports fundamental engineering research on devices and methods for measurement and quantification of biological analytes. Examples of biosensors include, but are not limited to, electrochemical/electrical biosensors, optical biosensors, plasmonic biosensors, and paper-based and nanopore-based biosensors. In addition to advancing biosensor technology development, proposals that address critical needs in biomedical research, public health, food safety, agriculture, forensic, environmental protection, and homeland security are highly encouraged. Proposals that incorporate emerging nanotechnology methods are especially encouraged.

Areas of interest include:

- multiplex biosensing platforms that exceed the performance of current state-of-the-art devices;
- novel transduction principles, mechanisms and sensor designs suitable for measurement in practical matrix and sample-preparation-free approaches, including error-free detection of pathogens and toxins in food matrices, waterborne pathogens, parasites, toxins, biomarkers in body fluids, neuron chemicals, and others that improve human condition;
- biosensors that enable measurement of biomolecular interactions in their native states, transmembrane transport, intracellular transport and reactions, and other biological phenomena;
- biosensing performance optimization for specific health applications such as point-of-care testing and personalized health monitoring;
- miniaturization of biosensors for lab-on-a-chip and cell/organ-on-a-chip applications to enable measurement of biological properties and functions of cell/tissues *in vitro*;
- biosensing systems with integration of artificial intelligence (AI) and machine learning;
- biosensors that exploit quantum correlations to develop a suite of analytical tools that will have superior performance over ordinary classical biosensing technology; and
- biosensors that leverage unique electrical properties of biomolecules, such as DNA; proteins; cells; and the nervous system to develop miniaturized biomedical devices for modulating and characterization of biological species.

Awards: Standard grants including Faculty Early Career Development (CAREER), Grants for Rapid Response Research (RAPID) and EARly-concept Grants for Exploratory Research (EAGER), Grant Opportunities for Academic Liaison with Industry (GOALI) and Conferences, Workshops, and Supplements

Letter of Intent: Not Required

Proposal Submission Deadline: Full Proposal Accepted Anytime

Contacts: Chenzhong Li chli@nsf.gov (703) 292-2857

Steven M. Zehnder zehnder@nsf.gov (703) 292-7014

Grant Program: Engineering of Biomedical Systems

Agency: National Science Foundation NSF PD 20-5345

RFP Website:

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505722&org=NSF&sel_org=NSF&from=fund

Brief Description: The **Engineering of Biomedical Systems** program is part of the Engineering Biology and Health cluster, which also includes: 1) the **Biophotonics** program; 2) the **Biosensing** program; 3) the **Cellular and Biochemical Engineering** program; and 4) the **Disability and Rehabilitation Engineering** program. The goal of the **Engineering of Biomedical Systems (EBMS)** program is to provide opportunities for creating fundamental and transformative research projects that integrate engineering and life sciences to solve biomedical problems and serve humanity in the long term. Projects are expected to use an engineering framework (for example, design or modeling) that supports increased understanding of physiological or pathophysiological processes. Projects must include objectives that advance both engineering and biomedical sciences.

Projects may include: methods, models, and enabling tools applied to understand or control living systems; fundamental improvements in deriving information from cells, tissues, organs, and organ systems; or new approaches to the design of systems that include both living and non-living components for eventual medical use in the long term.

The EBMS program supports fundamental and transformative research in the following areas of biomedical engineering:

- Development of validated models (living or computational) of healthy and pathological tissues and organ systems that can support improved fundamental understanding of these systems or development and testing of medical interventions,
- Design and validation of systems that integrate living and non-living components for improved understanding, diagnosis, monitoring, and treatment of disease or injury,
- Advanced biomanufacturing of three-dimensional tissues and organs, and
- Design and subsequent application of technologies and tools, including those that leverage an organism's microbiome, to investigate fundamental physiological and pathophysiological processes.

Awards: Standard grants including Faculty Early Career Development (CAREER), Grants for Rapid Response Research (RAPID) and EARly-concept Grants for Exploratory Research (EAGER), Grant Opportunities for Academic Liaison with Industry (GOALI) and Conferences, Workshops, and Supplements

Letter of Intent: Not Required

Proposal Submission Deadline: Full Proposal Accepted Anytime

Contacts: Aleksandr L. Simonian asimonia@nsf.gov (703) 292-2191

Steven M. Zehnder zehnder@nsf.gov (703) 292-7014

Grant Program: Biophotonics**Agency: National Science Foundation NSF PD 20-7236****RFP Website:**https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505719&org=NSF&sel_org=NSF&from=fund

Brief Description: The **Biophotonics** program is part of the Engineering Biology and Health cluster, which also includes: 1) the **Biosensing** program; 2) the **Cellular and Biochemical Engineering** program; 3) the **Disability and Rehabilitation Engineering** program; and 4) the **Engineering of Biomedical Systems** program.

The goal of the **Biophotonics** program is to explore the research frontiers in photonics principles, engineering and technology that are relevant for critical problems in fields of medicine, biology and biotechnology. Fundamental engineering research and innovation in photonics is required to lay the foundations for new technologies beyond those that are mature and ready for application in medical diagnostics and therapies. Advances are needed in nanophotonics, optogenetics, contrast and targeting agents, ultra-thin probes, wide field imaging, and rapid biomarker screening. Low cost and minimally invasive medical diagnostics and therapies are key motivating application goals.

Research topics in this program include:

- **Macromolecule Markers:** Innovative methods for labeling of macromolecules. Novel compositions of matter. Methods of fabrication of multicolor probes that could be used for marking and detection of specific pathological cells. Pushing the envelope of optical sensing to the limits of detection, resolution, and identification.
- **Low Coherence Sensing at the Nanoscale:** Low coherence enhanced backscattering (LEBS). N-dimensional elastic light scattering. Angle-resolved low coherence interferometry for early cancer detection (dysplasia).
- **Neurophotonics:** Studies of photon activation of neurons at the interface of nanomaterials attached to cells. Development and application of biocompatible photonic tools such as parallel interfaces and interconnects for communicating and control of neural networks.
- **Microphotonics and Nanophotonics:** Development and application of novel nanoparticle fluorescent quantum-dots. Sensitive, multiplexed, high-throughput characterization of macromolecular properties of cells. Nanomaterials and nanodevices for biomedicine.
- **Optogenetics:** Novel research in employing light-activated channels and enzymes for manipulation of neural activity with temporal precision. Utilizing nanophotonics, nanofibers, and genetic techniques for mapping and studying in real-time physiological processes in organs such as the brain and heart.

Awards: Standard grants including Faculty Early Career Development (CAREER), Grants for Rapid Response Research (RAPID) and EARly-concept Grants for Exploratory Research (EAGER), Grant Opportunities for Academic Liaison with Industry (GOALI) and Conferences, Workshops, and Supplements

Letter of Intent: Not Required

Proposal Submission Deadline: Full Proposal Accepted Anytime

Contacts: Leon Esterowitz lesterow@nsf.gov (703) 292-7942

Steven M. Zehnder szehnder@nsf.gov (703) 292-7014

Grant Program: Disability and Rehabilitation Engineering (DARE)**Agency: National Science Foundation NSF PD 20-5342****RFP Website:**https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505718&org=NSF&sel_org=NSF&from=fund

Brief Description: The **Disability and Rehabilitation Engineering** program is part of the Engineering Biology and Health cluster, which also includes: 1) the **Biophotonics** program; 2)

the **Biosensing** program; 3) the **Cellular and Biochemical Engineering** program; and 4) the **Engineering of Biomedical Systems** program.

The **Disability and Rehabilitation Engineering** program supports fundamental engineering research that will improve the quality of life of persons with disabilities through: development of new technologies, devices, or software; advancement of knowledge regarding healthy or pathological human motion; or understanding of injury mechanisms.

Research may be supported that is directed toward the characterization, restoration, rehabilitation, and/or substitution of human functional ability or cognition, or to the interaction between persons with disabilities and their environment. Areas of particular interest are neuroengineering and rehabilitation robotics. The program will also consider research in the areas of: new engineering approaches to understand healthy or pathological motion, both as a target for rehabilitation and as a means to characterize motion related to disability or injury; understanding injury at the tissue- or system-level such that interventions may be developed to reduce the impact of trauma and subsequent disability; or understanding the role of gut microbiota in modulating disability in the context of rehabilitation.

Emphasis is placed on significant advancement of fundamental engineering knowledge that facilitates transformative outcomes. We discourage applications that propose incremental improvements.

Awards: Standard grants including Faculty Early Career Development (CAREER), Grants for Rapid Response Research (RAPID) and EARly-concept Grants for Exploratory Research (EAGER), Grant Opportunities for Academic Liaison with Industry (GOALI) and Conferences, Workshops, and Supplements

Letter of Intent: Not Required

Proposal Submission Deadline: Full Proposal Accepted Anytime

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Steven M. Zehnder szehnder@nsf.gov (703) 292-7014

Grant Program: Particulate and Multiphase Processes

Agency: National Science Foundation NSF PD 20-1415

RFP Website:

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505700&org=NSF&sel_org=NSF&from=fund

Brief Description: The **Particulate and Multiphase Processes** program is part of the Transport Phenomena cluster, which also includes 1) the **Combustion and Fire Systems** program; 2) the **Fluid Dynamics** program; and 3) the **Thermal Transport Processes** program.

The goal of the **Particulate and Multiphase Processes** program is to support fundamental research on physico-chemical phenomena that govern particulate and multiphase systems, including flow of suspensions, drops and bubbles, granular and granular-fluid flows, behavior of micro- and nanostructured fluids, unique characteristics of active fluids, and self assembly/directed-assembly processes that involve particulates. The program encourages transformative research to improve our basic understanding of particulate and multiphase processes with emphasis on research that demonstrates how particle-scale phenomena affect the behavior and dynamics of larger-scale systems. Although proposed research should focus on fundamentals, a clear vision is required that anticipates how results could benefit important applications in advanced manufacturing, energy harvesting, transport in biological systems, biotechnology, or environmental sustainability. Collaborative and interdisciplinary proposals are encouraged, especially those that involve a combination of experiment with theory or modeling.

Major research areas of interest in the program include:

- **Multiphase flow phenomena:** Dynamics of particle/bubble/droplet systems, behavior of structured fluids (colloids/ferro-fluids), granular flows, rheology of multiphase systems, unique characteristics of active fluids, and novel approaches that relate micro- and nanoscale phenomena to macroscale properties and process-level variables.

- **Particle science and technology:** Aerosols, production of particles and polymer-particle complexes with engineered properties, self-assembly, directed assembly, and template-directed assembly of particles into functional materials and devices.
- **Multiphase transport in biological systems:** Analysis of physiological processes, applications of functionalized nanostructures in clinical diagnostics and therapeutics.
- **Interfacial transport:** Dynamics of particles and macromolecules at interfaces, kinetics of adsorption and desorption of nanoparticles and surfactants and their spatial distributions at interfaces, complex molecular interactions at interfaces, formation of interfacial complexes that affect the dynamics of particles.

Awards: Standard grants including Faculty Early Career Development (CAREER), Grants for Rapid Response Research (RAPID) and EARly-concept Grants for Exploratory Research (EAGER), Grant Opportunities for Academic Liaison with Industry (GOALI) and Conferences, Workshops, and Supplements

Letter of Intent: Not Required

Proposal Submission Deadline: Full Proposal Accepted Anytime

Contacts: William Olbricht wolbrich@nsf.gov 703-292-4842
Shahab Shojaei-Zadeh sshojaei@nsf.gov (703) 292-8045

Grant Program: Environmental Engineering

Agency: National Science Foundation NSF PD 20-1440

RFP Website:

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505692&org=NSF&sel_org=NSF&from=fund

Brief Description: The **Environmental Engineering** program is part of the **Environmental Engineering and Sustainability** cluster, which also includes 1) the **Nanoscale Interactions** program; and 2) the **Environmental Sustainability** program.

Environmental engineering is an interdisciplinary field that applies chemical, biological, and physical scientific principles to protect human and ecological health.

The goal of the **Environmental Engineering** program is to support potentially transformative fundamental research that applies scientific and engineering principles to 1) prevent, minimize, or re-use solid, liquid, and gaseous discharges of pollution to soil, water, and air by closing resource loops or through other measures; 2) mitigate the ecological and human-health impacts of such releases by smart/adaptive/reactive amendments or manipulation of the environment, and 3) remediate polluted environments through engineered chemical, biological, and/or geo-physical processes.

Integral to achieving these goals is a fundamental understanding of the transport and biogeochemical reactivity of pollutants in the environment. Therefore, research on environmental micro/biology, environmental chemistry, and environmental geophysics may be relevant providing the research has a clear objective of protecting human and ecological health.

Major areas of interest include (but are not limited to):

- **Building a future without pollution or waste:** Investigation of innovative biogeochemical processes that prevent or minimize the production of waste; waste valorization and other research that will lead to new technologies to extract resources from waste streams to close the resource loop.
- **Sustainable supply and protection of water:** Investigation of innovative biogeochemical processes that remove, biologically or chemically transform, and/or prevent the release of contaminants in surface and groundwater; innovative processes for recovery of water, nutrients, and other resources from wastewater, saline water, or brines; innovative approaches to smart and adaptive management of surface water, groundwater, and urban watersheds and storm water to

maintain/improve quality and prevent downstream impacts from nutrients and other water constituents.

- **Environmental chemistry, fate, and transport of nutrients and contaminants of emerging concern in air, water, soils, and sediments:** Investigation of transport and biogeochemical reactivity in the environment; environmental forensics to identify sources and reaction pathways; field- and laboratory scale experimental research that bridges gaps between data and predictions from molecular, continuum, and field-scale modeling.
- **Environmental engineering of the built environment:** Research to understand the biogeochemical reactivity of the built environment with the goal of enhancing and improving human and ecological health; research that will lead to new technologies to improve outdoor and indoor air quality; research to understand how drinking water and wastewater chemical characteristics and microbial community structure impact or are affected by water quality and human health.

Awards: Standard grants including Faculty Early Career Development (CAREER), Grants for Rapid Response Research (RAPID) and EARly-concept Grants for Exploratory Research (EAGER), Grant Opportunities for Academic Liaison with Industry (GOALI) and Conferences, Workshops, and Supplements

Letter of Intent: Not Required

Proposal Submission Deadline: Full Proposal Accepted Anytime

Contacts: Karl J. Rockne krockne@nsf.gov 703-292-5356 E13451

Brandi Schottel bschotte@nsf.gov (703) 292-4798 E13475

Grant Program: Environmental Sustainability

Agency: National Science Foundation NSF PD 20-7643

RFP Website:

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505695&org=NSF&sel_org=NSF&from=fund

Brief Description: The **Environmental Sustainability** program is part of the **Environmental Engineering and Sustainability** cluster together with 1) the **Environmental Engineering** program and 2) the **Nanoscale Interactions** program.

The goal of the **Environmental Sustainability** program is to promote sustainable engineered systems that support human well-being and that are also compatible with sustaining natural (environmental) systems. These systems provide ecological services vital for human survival. Research efforts supported by the program typically consider long time horizons and may incorporate contributions from the social sciences and ethics. The program supports engineering research that seeks to balance society's need to provide ecological protection and maintain stable economic conditions.

There are four principal general research areas that are supported:

- **Industrial ecology:** Topics of interest include advancements in modeling such as life cycle assessment, materials flow analysis, input/output economic models, and novel metrics for measuring sustainable systems. Innovations in industrial ecology are encouraged.
- **Green engineering:** Research is encouraged to advance the sustainability of manufacturing processes, green buildings, and infrastructure. Many programs in the Engineering Directorate support research in environmentally benign manufacturing or chemical processes. The Environmental Sustainability program supports research that would affect more than one chemical or manufacturing process or that takes a systems or holistic approach to green engineering for infrastructure or green buildings. Improvements in distribution and collection systems that will advance smart growth strategies and ameliorate effects of growth are research areas that are supported by Environmental Sustainability. Innovations in management of storm water, recycling

and reuse of drinking water, and other green engineering techniques to support sustainability may also be fruitful areas for research.

- **Ecological engineering:** Proposals should focus on the engineering aspects of restoring ecological function to natural systems. Engineering research in the enhancement of natural capital to foster sustainable development is encouraged.
- **Earth systems engineering:** Earth systems engineering considers aspects of large scale engineering research that involve mitigation of greenhouse gas emissions, adaptation to climate change, and other global concerns.

Awards: Standard grants including Faculty Early Career Development (CAREER), Grants for Rapid Response Research (RAPID) and EARly-concept Grants for Exploratory Research (EAGER), Grant Opportunities for Academic Liaison with Industry (GOALI) and Conferences, Workshops, and Supplements

Letter of Intent: Not Required

Proposal Submission Deadline: Full Proposal Accepted Anytime

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Brandi Schottel bschotte@nsf.gov (703) 292-4798

Grant Program: Process Systems, Reaction Engineering, and Molecular Thermodynamics

Agency: National Science Foundation NSF PD 20-1403

RFP Website:

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505727&org=NSF&sel_org=NSF&from=fund

Brief Description: The Process Systems, Reaction Engineering and Molecular Thermodynamics program is part of the Chemical Process Systems cluster, which also includes: 1) the Catalysis program; 2) the Electrochemical Systems program; and 3) the Interfacial Engineering program.

The goal of the Process Systems, Reaction Engineering and Molecular Thermodynamics program is to advance fundamental engineering research on the rates and mechanisms of chemical reactions, systems engineering and molecular thermodynamics as they relate to the design and optimization of chemical reactors and the production of specialized materials that have important impacts on society.

The program supports the development of advanced optimization and control algorithms for chemical processes, molecular and multi-scale modeling of complex chemical systems, fundamental studies on molecular thermodynamics, and the integration of this information into the design of complex chemical reactors. An important area supported by the program focuses on the development of energy-efficient and environmentally-friendly chemical processes and materials.

Awards: Standard grants including Faculty Early Career Development (CAREER), Grants for Rapid Response Research (RAPID) and EARly-concept Grants for Exploratory Research (EAGER), Grant Opportunities for Academic Liaison with Industry (GOALI) and Conferences, Workshops, and Supplements

Letter of Intent: Not Required

Proposal Submission Deadline: Full Proposal Accepted Anytime

Contacts: Triantafillos J. Mountziaris tmountzi@nsf.gov (703) 292-2894

Catherine Walker cawalker@nsf.gov (703) 292-7125

Grant Program: Cellular and Biochemical Engineering

Agency: National Science Foundation NSF PD 20-1491

RFP Website:

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505721&org=NSF&sel_org=NSF&from=fund

Brief Description: The **Cellular and Biochemical Engineering (CBE)** program is part of the **Engineering Biology and Health** cluster, which also includes: 1) the **Biophotonics** program; 2) the **Biosensing** program; 3) the **Disability and Rehabilitation Engineering** program; and 4) the **Engineering of Biomedical Systems** program.

The **Cellular and Biochemical Engineering** program supports fundamental engineering research that advances understanding of cellular and biomolecular processes. CBE-funded research may lead to the development of enabling technology for advanced biomanufacturing in support of the therapeutic cell, biochemical, biopharmaceutical, and biotechnology industries.

Fundamental to many research projects in this area is the understanding of how biomolecules, subcellular systems, cells, and cell populations interact, and how those interactions lead to changes in structure, function, and behavior. A quantitative treatment of problems related to biological processes is considered vital to successful research projects in the CBE program.

The program encourages highly innovative and potentially transformative engineering research leading to novel bioprocessing and biomanufacturing approaches. The CBE program also encourages proposals that effectively integrate knowledge and practices from different disciplines while incorporating ongoing research into educational activities.

Major areas of interest for the program include:

- Metabolic engineering and synthetic biology for biomanufacturing, including the design of synthetic metabolic components and synthetic cells,
- Quantitative systems biotechnology,
- Microbiome structure, function, synthesis, and maintenance,
- Protein and enzyme engineering, and
- Single cell and population dynamics and modeling in the context of biomanufacturing.

Awards: Standard grants including Faculty Early Career Development (CAREER), Grants for Rapid Response Research (RAPID) and EARly-concept Grants for Exploratory Research (EAGER), Grant Opportunities for Academic Liaison with Industry (GOALI) and Conferences, Workshops, and Supplements

Letter of Intent: Not Required

Proposal Submission Deadline: Full Proposal Accepted Anytime

Contacts: Steven W. Peretti speretti@nsf.gov (703) 292-7029

Steven M. Zehnder szehnder@nsf.gov (703) 292-7014

Grant Program: Combustion and Fire Systems

Agency: National Science Foundation NSF PD 20-1407

RFP Website:

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505699&org=NSF&sel_org=NSF&from=fund

Brief Description: The **Combustion and Fire Systems** program is part of the Transport Phenomena cluster, which also includes 1) the **Fluid Dynamics** program; 2) the **Particulate and Multiphase Processes** program; and 3) the **Thermal Transport Processes** program.

The goal of the **Combustion and Fire Systems** program is to advance energy conversion efficiency, improve energy security, enable cleaner environments, and enhance public safety.

The program endeavors to create fundamental scientific knowledge that is needed for useful combustion applications and for mitigating the effects of fire. The program aims to identify and understand the controlling basic principles and to use that knowledge to create predictive capabilities for designing and optimizing practical combustion devices.

Important outcomes for this program include:

- broad-based tools — experimental, theoretical, and computational — that can be applied to a variety of problems in combustion and fire systems;

- science and technology for clean and efficient generation of power;
- discoveries that enable clean environments (for example, by reduction in combustion-generated pollutants); and
- enhanced public safety through research on fire growth, inhibition, and suppression.

Awards: Standard grants including Faculty Early Career Development (CAREER), Grants for Rapid Response Research (RAPID) and EARly-concept Grants for Exploratory Research (EAGER), Grant Opportunities for Academic Liaison with Industry (GOALI) and Conferences, Workshops, and Supplements

Letter of Intent: Not Required

Proposal Submission Deadline: Full Proposal Accepted Anytime

Contacts: Harsha Chelliah hchellia@nsf.gov 703-292-7062
Shahab Shojaei-Zadeh sshojaei@nsf.gov (703) 292-8045

Grant Program: Fluid Dynamics

Agency: National Science Foundation NSF PD 20-1443

RFP Website:

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505698&org=NSF&sel_org=NSF&from=fund

Brief Description: The **Fluid Dynamics** program is part of the Transport Phenomena cluster, which also includes 1) the **Combustion and Fire Systems** program; 2) the **Particulate and Multiphase Processes** program; and 3) the **Thermal Transport Processes** program.

The **Fluid Dynamics** program supports fundamental research toward gaining an understanding of the physics of various fluid dynamics phenomena. Proposed research should contribute to basic scientific understanding via experiments, theoretical developments, and computational discovery.

Major areas of interest and activity in the program include:

- **Turbulence and transition:** High Reynolds number experiments; large eddy simulation; direct numerical simulation; transition to turbulence; 3-D boundary layers; separated flows; multi-phase turbulent flows; flow control and drag reduction. A new area of emphasis is high speed boundary layer transition and turbulence; the focus would be for flows at Mach numbers greater than 5 to understand cross-mode interactions leading to boundary layer transition and the ensuing developing and fully developed turbulent boundary layer flows. Combined experiments and simulations are encouraged.
- **Bio-fluid physics:** Bio-inspired flows; biological flows with emphasis on flow physics.
- **Non-Newtonian fluid mechanics:** Viscoelastic flows; solutions of macro-molecules.
- **Microfluidics and nanofluidics:** Micro-and nano-scale flow physics.
- **Wind and ocean energy harvesting:** Focused on fundamental fluid dynamics associated with renewal energy.
- **Fluid-structure interactions:** This is an NSF-AFOSR (Air Force Office of Scientific Research) joint funding area focused on theory, modeling and/or experiments for hypersonics applications. A small number of awards (depending on availability of funds and proposal quality) will be provided and will be jointly reviewed by NSF and AFOSR using the NSF panel format. Actual funding format and agency split for an award will be determined after the proposal selection process. The AFOSR program that participates in this initiative is the Program on High Speed Aerodynamics (program officer: [Dr. Ivett Leyva](#)).

Awards: Standard grants including Faculty Early Career Development (CAREER), Grants for Rapid Response Research (RAPID) and EARly-concept Grants for Exploratory Research (EAGER), Grant Opportunities for Academic Liaison with Industry (GOALI) and Conferences, Workshops, and Supplements

Letter of Intent: Not Required

Proposal Submission Deadline: Full Proposal Accepted Anytime

Contacts: Ronald D. Joslin rjoslin@nsf.gov (703) 292-7030

Shahab Shojaei-Zadeh sshojaei@nsf.gov (703) 292-8045

Grant Program: Secure and Trustworthy Cyberspace (SaTC)

Agency: National Science Foundation NSF 19-603

RFP Website: <https://www.nsf.gov/pubs/2019/nsf19603/nsf19603.htm>

Brief Description: The goals of the SaTC program are aligned with the National Science and Technology Council's (NSTC) [Federal Cybersecurity Research and Development Strategic Plan](#) (RDSP) and [National Privacy Research Strategy](#) (NPRS) to protect and preserve the growing social and economic benefits of cyber systems while ensuring security and privacy. The RDSP identified six areas critical to successful cybersecurity research and development: (1) scientific foundations; (2) risk management; (3) human aspects; (4) transitioning successful research into practice; (5) workforce development; and (6) enhancing the research infrastructure. The NPRS, which complements the RDSP, identifies a framework for privacy research, anchored in characterizing privacy expectations, understanding privacy violations, engineering privacy-protecting systems, and recovering from privacy violations. In alignment with the objectives in both strategic plans, the SaTC program takes an interdisciplinary, comprehensive and holistic approach to cybersecurity research, development, and education, and encourages the transition of promising research ideas into practice.

The SaTC program welcomes proposals that address cybersecurity and privacy, and draw on expertise in one or more of these areas: computing, communication and information sciences; engineering; education; mathematics; statistics; and social, behavioral, and economic sciences. Proposals that advance the field of cybersecurity and privacy within a single discipline or interdisciplinary efforts that span multiple disciplines are each welcome.

Awards: Standard grants; Anticipated Funding Amount: \$53,000,000

Letter of Intent: Not Required

Proposal Submission Deadline: Full Proposal Accepted Anytime

Contacts: Nina Amla, Program Director, CISE/CCF, telephone: (703) 292-7991, email: namla@nsf.gov

Shannon I. Beck, Associate Program Director/Program Coordinator, CISE/CNS, telephone: (703) 292-2487, email: sbeck@nsf.gov

Grant Program: Improving Undergraduate STEM Education: Education and Human Resources (IUSE: EHR)

Agency: National Science Foundation NSF 19-601

RFP Website: <https://www.nsf.gov/pubs/2019/nsf19601/nsf19601.htm>

Brief Description: The National Science Foundation (NSF) plays a leadership role in developing and implementing efforts to enhance and improve STEM education in the United States. Through the NSF *Improving Undergraduate STEM Education* (IUSE) initiative, the agency continues to make a substantial commitment to the highest caliber undergraduate STEM education through a Foundation-wide framework of investments. The IUSE: EHR is a core NSF STEM education program that seeks to promote novel, creative, and transformative approaches to generating and using new knowledge about STEM teaching and learning to improve STEM education for undergraduate students. The program is open to application from all institutions of higher education and associated organizations. NSF places high value on educating students to be leaders and innovators in emerging and rapidly changing STEM fields as well as educating a scientifically literate public. In pursuit of this goal, IUSE: EHR supports projects that seek to bring recent advances in STEM knowledge into undergraduate education, that adapt, improve, and incorporate evidence-based practices into STEM teaching and learning, and that lay the groundwork for

institutional improvement in STEM education. In addition to innovative work at the frontier of STEM education, this program also encourages replication of research studies at different types of institutions and with different student bodies to produce deeper knowledge about the effectiveness and transferability of findings.

IUSE: EHR also seeks to support projects that have high potential for broader societal impacts, including improved diversity of students and instructors participating in STEM education, professional development for instructors to ensure adoption of new and effective pedagogical techniques that meet the changing needs of students, and projects that promote institutional partnerships for collaborative research and development. IUSE: EHR especially welcomes proposals that will 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.

Awards: Standard grants **Anticipated Funding Amount:** \$63,000,000

Letter of Intent: Not Required

Proposal Submission Deadline: December 04, 2019

Engaged Student Learning and Institutional and Community Transformation Level 2 and 3
February 04, 2020

Contacts: Ellen Carpenter, telephone: (703) 292-5104, email: elcarpen@nsf.gov

Andrea L. Nixon, telephone: (703) 292-5323, email: anixon@nsf.gov

Grant Program: Inclusion Across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (NSF INCLUDES)

Agency: National Science Foundation NSF 19-600

RFP Website: <https://www.nsf.gov/pubs/2019/nsf19600/nsf19600.htm>

Brief Description: Through this solicitation, NSF Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (NSF INCLUDES) will support Planning Grants to build capacity for the development of collaborative infrastructure to: (a) facilitate innovative partnerships, networks, and theories of action for broadening participation in science, technology, engineering, and mathematics (STEM) at scale and (b) lead to the establishment of future centers, alliances, or other large-scale networks to address a broadening participation challenge. While this solicitation is open to all, NSF INCLUDES Design and Development Launch Pilots are especially encouraged to apply, as a Planning Grant could serve as an intermediate conduit for bringing their exploratory pilot work to scale.

A hallmark of NSF INCLUDES is to support the development of collaborative infrastructure to achieve systemic change. Collaborative infrastructure refers to the process by which partnering organizations come together with a shared vision; map out mutually reinforcing activities; develop goals, objectives, and measures to chart their progress; engage in constant communication; and advance the potential for expansion, sustainability, and scaling that would not be possible otherwise.

Awards: Standard grants Anticipated Funding Amount: \$1,000,000 to \$3,000,000

Letter of Intent: Not Required

Proposal Submission Deadline: December 03, 2019

Contacts: NSF INCLUDES, telephone: (703) 292-4635, email: nsfincludes@nsf.gov

Grant Program: Security and Preparedness (SAP)

Agency: National Science Foundation NSF PD 19-118Y

RFP Website:

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505712&org=NSF&sel_org=NSF&from=fund

Brief Description: The Security and Preparedness (SAP) Program supports basic scientific research that advances knowledge and understanding of issues broadly related to global and national security. Research proposals are evaluated on the criteria of intellectual merit and broader impacts; the proposed projects are expected to be theoretically motivated, conceptually precise, methodologically rigorous, and empirically oriented. Substantive areas include (but are not limited to) international relations, global and national security, human security, political violence, state stability, conflict processes, regime transition, international and comparative political economy, and peace science. Moreover, the Program supports research experiences for undergraduate students and infrastructural activities, including methodological innovations. The Program does not fund applied research. In addition, we encourage you to examine the websites for the National Science Foundation's Accountable Institutions and Behavior (AIB) and Law and Science (LS) programs.

Awards: Standard grants

Letter of Intent: Not Required

Proposal Submission Deadline: January 15, 2020 and August 17, 2020

Contacts: Zaryab Iqbal - Program Director ziqbal@nsf.gov 703-292-7174 W13241

Mauricia Barnett -Social Scientist mbarnett@nsf.gov 703-292-7309 W13200A

**Grant Program: EMERGING FRONTIERS IN RESEARCH AND INNOVATION (EFRI):
Distributed Chemical Manufacturing (DCheM)**

Agency: National Science Foundation NSF 19-599

RFP Website:

https://www.nsf.gov/publications/pub_summ.jsp?WT.z_pims_id=13708&ods_key=nsf19599

Brief Description: The Emerging Frontiers in Research and Innovation (EFRI) program of the NSF Directorate for Engineering (ENG) serves a critical role in helping ENG focus on important emerging areas in a timely manner. This solicitation is a funding opportunity for interdisciplinary teams of researchers to embark on rapidly advancing frontiers of fundamental engineering research. For this solicitation, we will consider proposals that aim to investigate emerging frontiers in one of the following two research areas:

- Distributed Chemical Manufacturing (DCheM)
- Engineering the Elimination of End-of-Life Plastics (E3P)

This solicitation will be coordinated with the Directorate for Biological Sciences, the Directorate for Mathematical and Physical Sciences and the Directorate for Social, Behavioral and Economic Sciences. EFRI seeks proposals with transformative ideas that represent an opportunity for a significant shift in fundamental engineering knowledge with a strong potential for long term impact on national needs or a grand challenge. The proposals must also meet the detailed requirements delineated in this solicitation. FURTHER INFORMATION: The Emerging Frontiers and Multidisciplinary Activities (EFMA) Office will host an informational webinar on Wednesday, September 18, 2019 at 1:00pm Eastern to discuss the EFRI program and answer questions about the FY 2020 solicitation. Details on how to join this webinar will be posted on the [EFMA website](#).

Awards: Standard grants; Proposals submitted to other program announcements and solicitations, including the Faculty Early Career Development Program (CAREER), must meet their respective deadlines; please refer to the deadline dates specified in the appropriate announcement or solicitation. Proposals for EARly-concept Grants for Exploratory Research (EAGER) or Rapid Response Research (RAPID) can be submitted at any time but Principal Investigators must contact the cognizant program director prior to submission. Proposals for supplements or workshops can be submitted at any time, and PIs are encouraged to contact the cognizant PD prior to submission.

Letter of Intent: LOI Due on November 4, 2019

Preliminary Proposal Deadline Date: December 2, 2019

Full Proposal Submission Deadline: March 26, 2020

Contacts: Sohi Rastegar srastega@nsf.gov (703) 292-8305

Louise R. Howe lhowe@nsf.gov (703) 292-2548

National Institutes of Health

Grant Program: NIH Blueprint for Neuroscience Research Education Program on Translational Devices (R25 Clinical Trial Not Allowed)

Agency: National Institutes of Health RFA-NS-20-003

RFP Website: <https://grants.nih.gov/grants/guide/rfa-files/RFA-NS-20-003.html>

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

The over-arching goal of this R25 program is to support educational activities that complement and/or enhance the training of a workforce to meet the nation's biomedical, behavioral and clinical research needs.

To accomplish the stated goal, this FOA invites research education grant applications with a primary focus on:

- **Courses for Skills Development:** The short course should provide participants with a sufficient overview of the medical device development and translation process to (1) understand the steps required for medical device development and translation, (2) anticipate and overcome common challenges in the process, and (3) identify and interact effectively with collaborators who have expertise in various aspects of device development and translation. The short course should target senior post-doctoral fellows, independent academic researchers, clinician scientists, and small business entrepreneurs interested in pursuing medical device development and/or translation efforts.

The short course must address the unique challenges (technical, strategic, and ethical) that academic and small business investigators are likely to face when developing and translating novel medical devices to diagnose and/or treat a broad range of nervous system disorders. The curriculum must draw upon lessons learned in academia and industry, and clearly identify the types of expertise and collaborations typically required to initiate and complete a successful project.

Award: Direct costs of up to \$250,000 per year may be requested. The maximum project period is 2 years.

Letter of Intent: November 16, 2019

Deadline: December 16, 2019.

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

All [types of non-AIDS applications](#) allowed for this funding opportunity announcement are due on these dates.

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

Grant Program: NIDCR Small Grant Program for New Investigators (R03 Clinical Trial Not Allowed)

Agency: National Institutes of Health PAR-19-370

RFP Website: <https://grants.nih.gov/grants/guide/pa-files/PA-19-370.html>

Brief Description: The NIDCR Small Grant Program for New Investigators (R03) is intended to provide support for New Investigators who are in the early stages of establishing independence in the areas of oral, dental and craniofacial research. Applications are invited from [New Investigators](#) whose proposed research addresses any of the goals described in the [NIDCR Strategic Plan](#). In brief, the NIDCR Strategic Plan is dedicated to enhancing dental, oral and craniofacial health through fundamental discoveries and the clinical application of these discoveries. For more detailed information regarding scientific areas of interest and for program official contacts, please visit the [NIDCR website](#).

The R03 is intended to support small research projects that can be carried out in a short period of time with limited resources. This program will support small pilot or feasibility studies and developmental research projects with the intention of obtaining sufficient preliminary data to support the subsequent submission of a competitive investigator initiated R01 or equivalent research application.

Award: A budget for direct costs of up to \$200,000 may be requested. Application budgets should not exceed \$100,000 in direct costs in either year.

Letter of Intent: Not Applicable

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

The first standard application due date for this FOA is October 16, 2019.

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

Grant Program: Trans-Agency Blood-Brain Interface Program (R61/R33 - Clinical Trials Not Allowed)

Agency: National Institutes of Health RFA-HL-20-021

RFP Website: <https://grants.nih.gov/grants/guide/rfa-files/RFA-HL-20-021.html>

Brief Description: To date, the role of blood in the Blood-Brain Interface (e.g., blood-derived factors, blood-based biomarkers, circulating exosomes) in the pathogenesis of neurological disorders and brain injury states (e.g., brain trauma, stroke, amyotrophic lateral sclerosis, multiple sclerosis, and Alzheimer's Disease) and the underlying neurovascular mechanisms remain largely unknown and under-researched. The intent of this FOA is to stimulate the development of a new field of blood-based science by re-defining the neurovascular unit as a component of the blood-brain interface. This will facilitate development of human-based neurovascular-blood models to identify targets for diagnostics and regulation of the blood-brain interface through multi-PI collaborations. An improved human-like BBB prototype/model can serve as an invaluable resource to the scientific community, and complement BBB research currently based on animal models.

The first phase (R61) will focus on the development and/or the adaptation of relevant investigative models that harness the informative power of novel scientific and technologic developments (e.g., -Omics, induced pluripotent stem cells (iPSC), microfluidics, single cell analysis, or systems biology) to evaluate the role of the blood/vascular components across the Blood-Brain Interface. The second phase (R33) will seek to characterize potential mechanisms underlying human BBB function using the model(s) developed in the first phase.

Award: Up to 5 new awards are expected to be funded in FY2020, and up to 5 new awards in FY 2021, for a total of up to 10 new awards. Application budgets are limited to \$425,000 direct costs per year.

Letter of Intent: February 10, 2020

Deadline: December 2, 2019, October 19, 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: SBIR/STTR Commercialization Readiness Pilot (CRP) Program Technical Assistance (SB1, R44) Clinical Trial Not Allowed

Agency: National Institutes of Health PAR-19-334 [SB1](#) Commercialization Readiness Pilot Program (CRP)

RFP Website: <https://grants.nih.gov/grants/guide/pa-files/PAR-19-334.html>

Brief Description: The SBIR and STTR programs were reauthorized and extended through 2022 under Public Law 114-328, Section 1834 and Public Law 115-232, including the reauthorization of the Commercialization Readiness Pilot (CRP) Program to the NIH. This funding opportunity announcement (FOA) aims to re-implement the CRP Program at NIH and CDC. The goal of this FOA is to facilitate the transition of previously funded SBIR/STTR Phase II projects to the commercialization stage by providing additional support for later stage technical assistance activities not typically supported through Phase II or Phase IIB grants or contracts. Only those applicants who have recently received Phase II or Phase IIB funding from one of the participating NIH Institutes/Centers or CDC are eligible for this program, as described in Section III.1.

CRP awards can either be a "Type 3" Revision (Competitive Revision/Supplement) to a currently active Phase II or Phase IIB award or can be a "Type 2" Renewal of a Phase II or IIB SBIR/STTR award that has ended and is closed out.

Scientific/Technical Scope

NIH and CDC ICs participating in this FOA may accept applications based on any topic within their mission or based on specific topics. While general topic areas are listed below, applicants should read the specific interests of the ICs carefully prior to submission.

Topic areas appropriate for this FOA include, but are not limited to the following:

Development of regulatory strategy, including assembling the documentation needed for the Investigational New Drug (IND) or Investigational Device Exemption (IDE) submission to the Federal Drug Administration (FDA).

Development of reimbursement strategy.

Design and planning for a clinical trial including: Preparation of documents required to support a clinical trial (e.g., case report forms, pharmacy manual, study coordinator manual, monitoring plan), preparation of clinical trial protocol, and preparation of investigator's brochure.

Development of an intellectual property strategy, including analysis of the patent landscape in the US and abroad.

Technical assistance associated with manufacturing.

Other technical assistance offered through a third-party technical assistance provider, including market research.

Unlike SBIR and STTR research and development grants or contracts, companies have the option of out-sourcing a significant portion of the work requested through the CRP, provided the expert services are appropriate for the work proposed and well justified in the application. The SBC should perform a substantive role in the oversight and management of the R&D proposed, including appropriate oversight of all scientific, programmatic, financial, and administrative matters related to the grant.

CRP awards cannot be used to pay filing fees associated with filing patents or FDA submissions.

CRP applicants cannot request Technical and Business Assistance (TABAs) funding.

Research and development activities outside of technical assistance, such as clinical and vertebrate animal research, are not permitted through this FOA. Applicants should consider some NIH Institutes/Centers participate in the following:

The Commercialization Readiness Pilot (CRP) Program: Technical Assistance and Late Stage Development Clinical Trial Required FOA ([PAR-19-335](#)) supports both technical assistance and late stage research and development activities for Phase II and Phase IIB awardees that involve clinical trials. The Commercialization Readiness Pilot (CRP) Program: Technical Assistance and Late Stage Development Clinical Trial Not Allowed FOA ([PAR-19-333](#)) supports both technical assistance and late stage research and development activities for Phase II and Phase IIB awardees that do not involve clinical trials.

Award: Budgets up to \$300,000 total funding support (direct costs, indirect costs, fee) for the entire budget period may be requested except for the CRP applications associated with the Institutes listed below:

National Cancer Institute (NCI): total funding support may not exceed \$250,000 in total costs (direct costs, indirect costs, fee)

Applicants are strongly encouraged to contact program officials prior to submitting any application in excess of the hard caps listed above and early in the application planning process. In all cases, applicants should propose a budget that is reasonable and appropriate for completion of the research project.

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

Deadline: [Standard dates](#) apply. All applications are due by 5:00 PM local time of applicant organization. All types of 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: Explainable Artificial Intelligence for Decoding and Modulating Neural Circuit Activity Linked to Behavior (R01 Clinical Trial Optional)

Agency: National Institutes of Health PAR-19-344

RFP Website: <https://grants.nih.gov/grants/guide/pa-files/PAR-19-344.html>

Brief Description: Despite the rapid growth and adoption of machine learning and artificial intelligence (AI) techniques to scientific questions, the lack of insight into the inner workings of these approaches has impeded full scientific understanding. For NIMH, the ultimate goal is a deep mechanistic understanding of normative brain functions and the pathophysiology of psychiatric disorders. However, machine learning techniques have often been applied to categorize and predict neural and behavioral outcomes without providing an understanding of what drives those predictions and classifications. Without knowing the factors critical to a machine-learning based outcome, it is difficult to optimize these approaches for novel conditions or to identify targets for further study or intervention development.

eXplainable Artificial Intelligence (XAI) consists of artificial intelligence algorithms in which the processes of arriving at final actions (e.g., predictions, classifications, and recommendations) can be easily understood by its users. XAI aims to overcome limitations of classical machine learning, including a lack of transparency and non-generalizability. In optimizing computations to maximize accuracy or performance, a standard AI may learn useful rules from the specific training set. However, it may also learn inappropriate or non-generalizable rules. XAI provides methods to examine existing machine learning models more closely and new approaches that are explicitly designed to provide greater transparency. In an open and transparent XAI, users should have the ability to audit rules to discover how likely it is that the system will generalize outside a specific training-set to future real-world data.

NIMH is interested in transforming classical ‘black box’ machine learning models into XAI ‘glass box’ models, without significantly sacrificing performance. The goal of this FOA is to encourage investigators to apply XAI techniques to further our understanding of the neural circuitry linked to

behavior and to improve our understanding of therapeutic strategies to enhance cognitive, affective, or social function. To develop new treatments for mental illness, a better understanding of how to modulate neural dynamics responsible for complex functional domains and/or maladaptive behaviors is critical. In order to achieve this understanding using XAI techniques, collaborations between computational and experimental investigators are strongly encouraged. In the context of mental health, the amount and type of explanatory information accessed may vary based on the stakeholder (clinicians, patients, or researchers) interacting with the AI system.

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

Letter of Intent: February 10, 2020

Deadline: March 10, 2020, March 10, 2021, March 10, 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.

Grant Program: The NCI Predoctoral to Postdoctoral Fellow Transition Award (F99/K00)

Agency: National Institutes of Health RFA-CA-19-057

RFP Website: <https://grants.nih.gov/grants/guide/rfa-files/RFA-CA-19-057.html>

Brief Description: The objective of the NCI Predoctoral to Postdoctoral Fellow Transition Award (F99/K00) is to identify and encourage outstanding graduate students who are recognized by their institutions as having high potential and strong interest in pursuing careers as independent cancer researchers, and then to facilitate their successful transition to postdoctoral positions. The F99/K00 award is intended for individuals who require 1-2 years to complete their Ph.D. dissertation research training (F99 phase) before transitioning to mentored postdoctoral research training (K00 phase). Consequently, applicants are expected to propose an individualized research training plan for the next 1-2 years of dissertation research training and a plan for 3-4 years of mentored postdoctoral research and career development activities that will prepare them for independent cancer-focused research careers.

The F99/K00 award is meant to provide up to 6 years of support in two phases. The initial (F99) phase will provide support for 1-2 years of dissertation research (final experiments, dissertation preparation, and selection of a postdoctoral mentor). The transition (K00) phase will provide up to 4 years of mentored postdoctoral research and career development support, contingent upon successful completion of the doctoral degree requirements and securing a cancer-focused postdoctoral position. The two award phases are intended to be continuous in time. A K00 award will be made only to a PD/PI who has successfully completed the F99-supported training, secured a cancer-focused postdoctoral appointment, and provided NCI with a strong research and career development plan.

Award: NCI intends to commit \$1.2 M to fund up to 24 awards in FY2020. For the F99 phase, award budgets are composed of stipends, tuition and fees, and institutional allowance, as described below. For the K00 phase, award budgets are composed of salary and fringe benefits, tuition and fees, research and career development support, and indirect costs.

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

Deadline: December 4, 2019, by 5:00 PM local time of applicant organization. All [types of non-AIDS applications](#) allowed for this funding opportunity announcement are due on these dates. No late applications will be accepted for this Funding Opportunity Announcement.

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

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

Grant Program: Long Range Broad Agency Announcement (BAA) for Navy and Marine Corps Science & Technology

Agency: Department of Defense Office of Naval Research N00014-20-S-B001

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

Brief Description: ONR's solicitations are for research and development and are accomplished through BAAs announcing research interests. BAAs are a streamlined method used to advertise and solicit performers for ONR research areas. A BAA or FOA is used to fill requirements for scientific study and experimentation directed toward advancing the state-of-the-art or increasing knowledge or understanding rather than focusing on a specific system or hardware solution. FOAs only result in the award of an assistance instrument and BAAs may result in the award of both acquisition and assistance instruments. Special Program Announcements are often released to focus attention on a specific topic and funding availability.

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

Awards: Various

Proposal Deadline: September 30, 2020

Contact Information: Lynn Christian Office of Naval Research

Email Address: lynn.christian@navy.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: DARPA Young Faculty Award**Agency: Department of Defense DARPA DARPA-RA-19-01****Website:**

https://www.fbo.gov/index?s=opportunity&mode=form&id=74f9691bce51a95c5a2380dad5c787b5&tab=core&_cview=1

Brief Description: The Defense Advanced Research Projects Agency (DARPA) Young Faculty Award (YFA) program aims to identify and engage rising stars in junior faculty positions in academia and equivalent positions at non-profit research institutions and expose them to Department of Defense (DoD) and National Security challenges and needs. In particular, this YFA will provide high-impact funding to elite researchers early in their careers to develop innovative new research directions in the context of enabling transformative DoD capabilities. The long-term goal of the program is to develop the next generation of scientists and engineers in the research community who will focus a significant portion of their future careers on DoD and National Security issues. DARPA is particularly interested in identifying outstanding researchers who have previously not been performers on DARPA programs, but the program is open to all qualified applicants with innovative research ideas.

Awards: Various

Executive Summary Due Date: September 18, 2019, 4:00 p.m.

FAQ Submission Deadline: November 9, 2019, 4:00 p.m. See Section VIII.A.

Full Proposal Due Date: November 19, 2019, 4:00 p.m.

Contact Information: RA Email: YFA2020@darpa.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

Grant Program: Program Disruptioneering; Disruptive Capabilities for Future Warfare**Agency: Department of Defense DARPA DARPA-PA-19-02 and HR001119S0054**

Website:

https://www.fbo.gov/index?s=opportunity&mode=form&id=890c20829acd406c338ac6287403f970&tab=core&_cview=0

https://www.fbo.gov/index?s=opportunity&mode=form&id=e7248da47889d975d0ccb0261d002a9a&tab=core&_cview=1

Brief Description: The mission of the Defense Advanced Research Projects Agency is to make strategic, early investments in science and technology that will have long-term positive impact on our nation's national security. As part of this mission, DARPA makes high-risk, high-reward investments in science and technology that have the potential to disrupt current understanding and/or approaches. The pace of discovery in both science and technology is accelerating worldwide, resulting in new fields of study and the identification of scientific areas ripe for disruption. While DARPA's existing investment strategy continues to yield success, in order to capitalize on these new opportunities, its approach to investing must include faster responses with more small, targeted investments. Disruptioneering will enable DARPA to initiate a new investment in less than 90 days from idea inception.

HR001119S0054: The Tactical Technology Office of the Defense Advanced Research Projects Agency is soliciting executive summaries, proposal abstracts and proposals for applied research, advanced technology development, and platform demonstrations to enable disruptive capabilities for future warfare.

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: RFP is open until March 18, 2020; HR001119S0054: June 11, 2020

Contact Information: BAA Coordinator DARPA-PA-19-02@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 agency¹ 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

¹ The U.S. Department of Education publishes a list of nationally recognized accrediting agencies on <https://www.ed.gov/accreditation>

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. Grant funds will be awarded to an apprenticeship partnership of public and private sector entities which together seek to develop and implement new apprenticeship models; or expand an existing apprenticeship program to a new industry sector or occupation, a new population, on a local/regional, statewide, or national scale.

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: The closing date for receipt of applications under this Announcement is September 24, 2019 no later than 4:00:00 p.m. Eastern Time.

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

EPA

Grant Program: 2019 Healthy Communities Grant Program

Agency: Environmental Protection Agency EPA-R1-HC-2019

Website: <https://www3.epa.gov/region1/eco/uep/pdfs/2019-hcgp-rfa.pdf>

Brief Description: The Healthy Communities Grant Program is the U.S. Environmental Protection Agency, Region 1's (EPA New England) main competitive grant program to work directly with communities to support EPA's "Back-to-Basics" agenda to reduce environmental risks, protect and improve human health and improve the quality of life. The Healthy Communities Grant Program will achieve these goals through identifying and funding projects that:

- Target resources to benefit communities at risk [areas needing to create community resilience, environmental justice areas of

potential concern, sensitive populations (e.g., children, elderly, tribes, urban and rural residents, and others at increased risk)]. • Assess, understand, and reduce environmental and human health risks. • Increase collaboration through partnerships and community-based projects. • Build institutional and community capacity to understand and solve environmental and human health problems. • Advance emergency preparedness and ecosystem resilience. • Achieve measurable environmental and human health benefits. To qualify as eligible projects under the Healthy Communities Grant Program, proposed projects must: (1) be located in and/or directly benefit one or more of the Target Investment Areas; and (2) identify how the proposed project will achieve measurable environmental and/or public health results in one or more of the Target Program Areas. Please see Section III for further information on eligibility requirements.

Awards: Up to \$800k; Anticipated Funding: Approximately \$4 million total for all awards

Submission Deadline: September 17, 2019: 11:59:59 pm Eastern Time

Contact: Technical Contact: Intaek Hahn; phone: 202-564-4377; email: hahn.intaek@epa.gov

Department of Energy

Grant Program: Performance-Based Energy Resource Feedback, Optimization, And Risk Management

Agency: Department of Energy DE-FOA-0002171

Website: <https://arpa-e-foa.energy.gov/#Foaldcf23a62d-a269-4369-a408-bfb4ba014f8d>

Brief Description: Optimal utilization of all grid assets requires a fundamental shift in grid management rooted in an understanding of asset risk and system risk. ARPA-E seeks innovative management systems that (i) represent the relative delivery risk of each asset and (ii) balance the collective risk of all assets across the grid. A risk-driven paradigm will allow operators to fully understand the true likelihood of maintaining a supply-demand balance and system reliability; this is critical for all power systems and is essential for grids with high levels of stochastic resources.

Existing management practices were designed for a grid consisting of and fully reliant on conventional generation assets. Present operational and planning practices do not acknowledge or leverage the true capabilities and associated challenges of emerging assets. A risk-driven paradigm will allow emerging assets to be trusted and relied upon to provide the critical products and services necessary to maintain an efficient and reliable grid, thereby breaking the persistent reliance on conventional generation technologies.

Through the **Performance-based Energy Resource Feedback, Optimization, and Risk Management** (PERFORM) program, Applicants will propose methods to quantify and manage risk at the asset level and at the system level. At the asset level, ARPA-E envisions the design of a risk score or measure that clearly communicates the physical delivery risk of an asset's offer, similar to the role a credit score plays in determining the creditworthiness of an individual. At the system level, ARPA-E envisions the design of grid management systems that endogenously capture uncertainty and evaluate and hedge the system risk position to meet or exceed a baseline system risk index. The anticipated outcome of PERFORM is a transformative and disruptive risk-driven grid management paradigm that optimally utilizes all assets (including emerging technologies) to reduce costs and improve reliability.

Awards: Various; Available Funding: \$30,000,000

Proposal Submission Deadline:

First Deadline for Questions to ARPA-E-CO@hq.doe.gov: 5 PM ET, October 18, 2019

Submission Deadline for Concept Papers: 9:30 AM ET, October 28, 2019

Second Deadline for Questions to ARPA-E-CO@hq.doe.gov: 5 PM ET, TBD

Submission Deadline for Full Applications: 9:30 AM ET, TBD

Contact: ExchangeHelp@hq.doe.gov

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

Grant Program: Stewardship Science Academic Alliances (SSAA) Program

Agency: Department of Energy DE-FOA-0002149

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

Brief Description: The Stewardship Science Academic Alliances (SSAA) Program was established in 2002 to support state-of-the-art research at U.S. academic institutions in areas of fundamental physical science and technology of relevance to the SSP mission. The SSAA Program provides the research experience necessary to maintain a cadre of trained scientists at U.S. universities to meet the nation's current and future SSP needs, with a focus on those areas not supported by other federal agencies. It supports the DOE/NNSA's priorities both to address the workforce specific needs in science, technology, engineering, and mathematics and to support the next generation of professionals who will meet those needs.

Awards: Various; Available Funding: \$10,000,000

Proposal Submission Deadline: October 29, 2019

Contact: FedConnect.net

Grant Program: Request for Information (RFI): Marine Sciences Laboratory

Agency: Department of Energy DE-FOA-0002123

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

Brief Description: The purpose of this RFI is to solicit feedback from industry, academia, research laboratories, government agencies, and other stakeholders on issues related to the growing Research and Development (R&D) interest in the use of the Pacific Northwest National Laboratory's (PNNL's) Marine Sciences Laboratory (MSL) facilities for renewable energy, maritime markets, and energy storage research, technology development and testing. This information will help DOE and PNNL prioritize resources and investments. This is solely a request for information and not a Funding Opportunity Announcement (FOA). EERE is not accepting applications.

Responses to this RFI must be submitted electronically to WPTORFI@ee.doe.gov no later than 5:00 p.m. on August 8, 2019. Responses must be provided as attachments to an email. Only electronic responses will be accepted.

This is a Request for Information (RFI) only. EERE will not pay for information provided under this RFI and no project will be supported as a result of this RFI. This RFI is not accepting applications for financial assistance or financial incentives.

Awards: TBD

Proposal Submission Deadline: Responses to this RFI must be submitted electronically to this inbox WPTORFI@ee.doe.gov

Contact: EERE_ExchangeSupport@hq.doe.gov Contact information for technical issues

NASA

Grant Program: ROSES 2019: Research Opportunities in Space and Earth Sciences: Astrophysics Science SmallSat Studies

Agency: NASA NNH19ZDA001N and NNH19ZDA001N-AS3

Website: <https://nspires.nasaprs.com/external/solicitations/summary.do?solId={ABB576B8-F844-25E0-AD23-9E94AAC04AE1}&path=&method=init>

Brief Description: The Astrophysics Science SmallSat Studies (AS3) program is intended to capitalize on the creativity in the astrophysics science community to envision science enabled by smaller and significantly lower cost missions. NASA expects to make awards for mission concept studies that will span the breadth of possible science investigations enabled by CubeSat/SmallSat technologies and available secondary launch opportunities. Mission design assistance, if required, for these mission concepts will be offered by NASA during the six-month studies (see Section 3.1). If such assistance is proposed, the proposal must include its cost within the submitted budget. NASA solicited missions of this class in the recent 2019 Astrophysics Explorers Missions of Opportunity solicitation and plans to do so at each future Astrophysics Explorers solicitation. NASA recognizes and supports the benefits of having diverse and inclusive scientific, engineering, and technology communities and fully expects that such values will be reflected in the composition of all proposal teams as well as peer review panels (science, engineering, and technology), science definition teams, and mission and instrument teams.

Awards: Various

Proposal Deadline: December 19, 2019 for NNH19ZDA001N-AS3

March 27, 2020 for NNH19ZDA001N

Contact: Michael Garcia, Astrophysics Division, Telephone: (202) 358-1053

Email: michael.r.garcia@nasa.gov

Grant Program: NASA Space Technology Graduate Research Opportunities - Fall 2020

Agency: NASA 80HQTR19NOA01-20NSTGRO_B4

Website: <https://nspires.nasaprs.com/external/solicitations/summary!init.do?sollId=%7B3691C1EE-588D-6D31-4DF0-361AFE16E9E9%7D&path=open>

Brief Description: This call for graduate student space technology research proposals, titled NASA Space Technology Graduate Research Opportunities – Fall 2020 (NSTGRO20), solicits proposals on behalf individuals pursuing or planning to pursue master’s or doctoral (Ph.D.) degrees in relevant space technology disciplines at accredited U.S. universities. NASA Space Technology Graduate Researchers will perform innovative space technology research and will improve America’s technological competitiveness by providing the Nation with a pipeline of innovative space technologies. NASA Space Technology Graduate Researchers will perform research at their respective campuses and at NASA Centers. In addition to their faculty advisor, each recipient will be matched with a technically relevant and community-engaged NASA researcher who will serve as the research collaborator on the award. Through this collaboration, graduate students will be able to take advantage of broader and/or deeper space technology research opportunities directly related to their academic and career objectives, acquire a more detailed understanding of the potential end applications of their space technology efforts, and directly disseminate their research results within the NASA community.

Awards: Awards resulting from this solicitation will be made in the form of grants to accredited U.S. universities with the faculty advisor as the Principal Investigator (PI).

Proposal Deadline: November 5, 2019

Contact: Claudia M Meyer NASA Space Technology Research Grants Phone: 202-358-4717 Fax: 202-358-3602

[STRG Program Exec](#)

Grant Program: Use of the NASA Physical Sciences Informatics System

Agency: NASA NNH17ZTT001N-17PSI-F

Website: <https://nspires.nasaprs.com/external/>

Brief Description: NASA plans to host a proposers’ conference via Webex shortly after the release of the Appendix to provide more information and to answer questions about the NRA and the PSI

system. NASA's Physical Sciences Research Program conducts fundamental and applied physical sciences research, with the objective of enabling exploration and pioneering scientific discovery. NASA's experiments in the various disciplines of physical science reveal how physical systems respond to the near absence of gravity. They also reveal how other forces that on Earth are small, as compared to gravity, can dominate system behavior in space.

The PSI system (<http://psi.nasa.gov>) is an online, publicly accessible database of completed physical science reduced-gravity flight experiments conducted on the ISS, on Space Shuttle flights, on Free Flyers, or on commercial cargo flights to and from the ISS, and related ground-based studies. It is a tool designed for researchers to data mine information from reduced-gravity physical sciences experiments and use it to further science in accordance with the open science approach, while also meeting the requirements of the nation's Open Data Policy. This NRA solicits ground-based research proposals that present a compelling case on how the experimental data from the PSI system will be used to promote the advancement of further research. Proposers must show a clear path from the scientific data obtained from the PSI system to the proposed investigation. In addition, the project must address an important problem in the proposed area of research and advance scientific knowledge or technology.

This NRA will remain open until 2022, with planned annual opportunities to propose to be provided through a series of appendices. This announcement is for the release of Appendix F, which solicits proposals in the following five research areas: Combustion Science, Complex Fluids, Fluid Physics, Fundamental Physics and Materials Science.

Awards: Various

Proposal Deadline: Proposals for Appendix F are due on or about December 16, 2019.

Contact: Dr. Francis Chiamonte, Program Scientist for Physical Sciences [Contact email](#)

Grant Program: University Student Research Challenge

Agency: NASA NNH19ZEA001N-USRC

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

Brief Description: Amendment 1 to the NASA ARMD Research Opportunities in Aeronautics (ROA) 2019 NRA has been posted on the NSPIRES site. University Student Research Challenge (solicitation NNH19ZEA001N-USRC) seeks to challenge students to propose new aeronautics ideas/concepts that are relevant to NASA Aeronautics. USRC will provide students, from accredited U.S. colleges or universities, with grants for their projects and it includes the challenge of raising a modest amount of cost share funds through crowdfunding platform. The process of creating and preparing a crowdfunding campaign acts as a teaching accelerator - requiring students to act like entrepreneurs and taking action. Crowdfunding also raises awareness about students' research among the public. The solicitation goal can be accomplished through project ideas such as advancing the design, developing technology or capabilities in support of aviation, by demonstrating a novel concept, or enabling advancement of aeronautics-related technologies. There have been a number of changes from the previous USRC pilot project, including NASA providing a larger share of funds and half of that being provided upfront. Notices of Intent (NOIs) are not required for this solicitation. Proposals can be submitted at any time and will be evaluated in three cycles: October 30, 2019, February 26, 2020, and June 24, 2020.

Awards: Various

Proposal Deadline: October 30, 2019

Contact: Koushik Datta HQ-USRC@mail.nasa.gov

Grant Program: NASA Innovative Advanced Concepts (NIAC) Phase I

Agency: NASA 80HQTR19NOA01-20NIAC_A1

Website: <https://nspires.nasaprs.com/external/solicitations/summary.do?sollId=%7B4F9000A1-EF96-1E04-959B-A1991D0BE4C3%7D&path=&method=init>

Brief Description: The NIAC Program focuses on early stage feasibility studies of visionary concepts that address national government and commercial aerospace goals. Concepts are solicited from any field of study that offers a radically different approach or disruptive innovation that may significantly enhance or enable new human or robotic science and exploration missions. Proposed concepts must be framed in terms of a mission context that clearly identifies scientific or technical advancements and associated benefits compared to current approaches. Comparatively high risk and far term, NIAC concepts are transformational investments in future NASA and commercial space capabilities. The entry Technology Readiness Level (TRL) for Phase I concepts should be TRL 2 or lower. Proposed concepts must identify credible approaches toward new scientific or technical innovations that advance NASA's strategic themes to Discover, Explore, Develop, and Enable, as outlined in the 2018 NASA Strategic Plan. Advancements are sought across the broad spectrum of disciplines that support the goals and objectives encompassed by these themes, including nontraditional areas such as biophysics, life sciences, human factors engineering, artificial intelligence, resource sustainability, and other topics that may inspire innovative approaches to meet future exploration needs.

Awards: Expected Award Amount: Not to exceed \$125K

Notice of Intent: See below

Proposal Deadline: Proposer's Virtual Forum: August 22, 2019, 1:00-3:00PM ET Step A Proposal Due: September 20, 2019, 5:00pm ET Step B Invitations Issued: November 1, 2019 (Target) Step B Proposal Due: December 13, 2019 (Target), 5:00pm ET

Contact: Jason Derleth NIAC Program Executive Space Technology Mission Directorate, NASA Headquarters hq-niac@mail.nasa.gov

Grant Program: ROSES 2019: Living With a Star Science

Agency: NASA NNH19ZDA001N-LWS

Website: <https://nspires.nasaprs.com/external/solicitations/summary.do?sollId=%7B922F3674-F02A-FB17-DD75-0230277DDDAC%7D&path=&method=init>

Brief Description: The Living With a Star (LWS) Program emphasizes the science necessary to understand those aspects of the Sun and Earth's space environment that affect life and society. The ultimate goal of the LWS Program is to provide a scientific understanding of the system that leads to predictive capability of the space environment conditions at Earth, other planetary systems, and in the interplanetary medium. The LWS program objectives are as follows: 1. Understand how the Sun varies and what drives solar variability. 2. Understand how the Earth and planetary systems respond to dynamic external and internal drivers. 3. Understand how and in what ways dynamic space environments affect human and robotic exploration activities. The LWS Program seeks to make progress in understanding the complex Heliophysics system, focusing on the fundamental science of the most critical interconnections. Further information on the LWS Program can be found at the LWS website (<http://lwstrt.gsfc.nasa.gov/>). The LWS Science program maintains a strategy with three components, namely, Strategic Capabilities, Targeted Investigations, and CrossDisciplinary Infrastructure Building programs. Only the Targeted Investigations will be competed in this announcement. Proposers interested in Strategic Capabilities should see Program Element B.10 Living With a Star Strategic Capabilities. Cross-Disciplinary Infrastructure Building may be competed in ROSES-2020.

Awards: Available funding: \$4,900,000

Notice of Intent: Contact the program officer

Proposal Deadline: Step 1 Proposals Due December 05, 2019

Contact: Simon Plunkett Heliophysics Division Science Mission Directorate National Aeronautics and Space Administration Washington, DC 20546-0001 Telephone: (202) 358-2034 Email: simon.p.plunkett@nasa.gov

Grant Program: ROSES 2019: B.7 Space Weather Science Applications Operations 2 Research

Agency: NASA NNH19ZDA001N-SWO2R

Website: <https://nspires.nasaprs.com/external/solicitations/summary.do?solId={BD18A167-6DE8-1A35-A0ED-96F16AC6DE49}&path=&method=init>

Brief Description: In October 2015, the National Science and Technology Council (NSTC) in the Executive Office of the President released the National Space Weather Strategy and the National Space Weather Action Plan (SWAP). In March 2019, these were updated with the release of the National Space Weather Strategy and Action Plan (NSW-SAP). The objectives of the actions described in the SWAP and NSW-SAP are to improve the understanding of, forecasting of, and preparedness for space weather events, recognizing the need for close cooperation among the federal agencies. The SWAP and NSW-SAP call for NASA, National Science Foundation (NSF), and Department of Defense (DOD) to identify and support basic research on space weather. They also direct NASA, Department of Commerce (DOC), and DOD to identify and support research opportunities that address targeted operational space-weather needs. Furthermore, they direct NASA, NSF, DOC, and DOD to facilitate the transition of space weather information and prediction capabilities to the Nation's space weather service providers (research-to-operations and operations-to-research). In response to the need to advance and coordinate the Nation's space weather research and operations capabilities, NASA has established the Heliophysics Space Weather Science Applications program, of which this operations-to-research (O2R) call is a part. NASA is supporting this funding opportunity in coordination with DOC/National Oceanic and Atmospheric Administration (NOAA) to promote O2R activities. For this call, the objective of O2R efforts is broadly defined as the joint pursuit of improvements of operational capabilities and advancements in related fundamental research.

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

Awards: Various

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

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

Grant Program: Heliophysics Theory, Modeling, and Simulations: due dates TBD

Agency: NASA NNH19ZDA001N-HTMS

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

Brief Description: The Heliophysics Theory, Modeling, Simulations (H-TMS) program is a component of the Heliophysics Research Program. Proposers interested in this program element are encouraged to see the overview of the Heliophysics Research Program in Appendix B.1 of this ROSES NRA. The H-TMS program was previously one element of the Heliophysics Grand Challenges Research (H-GCR) program (H-GCR-TMS, last competed in ROSES-2016 as program element B.5). Before that it was called "Heliophysics Theory Program" (HTP, last competed in ROSES-2013). For simplification, this program is now referred to as the Theory, Modeling, and Simulations (TMS) element in the Heliophysics program. The former Heliophysics Theory Program provides the foundation of the TMS element. Increasingly, as

computing power becomes more affordable and more available, numerical simulations and modeling become tools that can and have been used synergistically with data analyses and rigorous theory development to solve the fundamental problems of Heliophysics. They lead the way to new understanding and drive science concepts for future strategic missions. The ultimate goal of TMS investigations is to provide a complete chain of reasoning extending from the basic laws of nature to comparison with observation to the identification of future quantitative tests of the behavior of the environment. NASA acknowledges this and renames the element "Theory, Modeling, and Simulations."

Awards: Various

Notice of Intent: Not Required

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

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

Grant Program: Astrophysics Research and Analysis: due dates TBD

Agency: NASA NNH19ZDA001N-APRA

Website: <https://nspires.nasaprs.com/external/solicitations/summary.do?solId=%7B90F8A275-496D-A0FA-82A0-0BF6E9ABBA67%7D&path=&method=init>

Brief Description: The Astrophysics Research and Analysis Program (APRA) program solicits basic research proposals for investigations that are relevant to NASA's programs in astronomy and astrophysics and includes research over the entire range of photons, gravitational waves, and particle astrophysics. Awards may be for up to four years' duration (up to five years for suborbital investigations), but shorter-term proposals are typical; four-year or five-year proposals must be well justified. Proposals for suborbital investigations are particularly encouraged. APRA investigations may advance technologies anywhere along the full line of readiness levels, from Technology Readiness Level (TRL) 1 through TRL 9. The emphasis of this program element is on technologies and investigations that advance NASA astrophysics missions and goals.

Awards: Various

Notice of Intent: Not Required

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

Contact: Dominic J. Benford Astrophysics Division Science Mission Directorate NASA Headquarters Washington, DC 20546-0001 Telephone: (202) 358-1261 Email: Dominic.Benford@nasa.gov

National Endowment of Humanities

Grant Program: Collaborative Research

Agency: National Endowment for the Humanities 20191205-RZ

Website: <https://www.neh.gov/grants/research/collaborative-research-grants>

Brief Description: The program allows projects that propose research in a single field of study, as well as interdisciplinary work. Projects that include partnerships with researchers from the natural and social sciences are encouraged, but they must remain firmly rooted in the humanities and must employ humanistic methods. Partnerships among different types of institutions are welcome. For example, research universities might partner with teaching colleges, libraries, museums, or independent research institutions.

Proposed projects must lead to tangible and sustainable outcomes such as co-authored or multi-authored books; born-digital publications; themed issues of peer-reviewed journals; a series of peer-reviewed

articles in academic journals or articles in general audience publications or both; and open-access digital resources. All project outcomes must be based on and must convey interpretive humanities research.

Awards: Convening Grants: \$50,000

Publication Grants: \$250,000 (no more than \$100,000 per year)

Deadlines: Application due: December 4, 2019

Contact: Contact the Division of Research Programs Team: 202-606-8200
collaborative@neh.gov

ACI Foundation

Grant Program: Concrete Research Council (CRC) Awards

Agency: ACI Foundation

Website: <https://www.acifoundation.org/Portals/12/Files/PDFs/RFP-Application-Guide.pdf>

Brief Description: The [ACI Foundation](http://www.acifoundation.org)'s Concrete Research Council (CRC) works to advance the knowledge and sustainable aspects of concrete materials, construction, and structures by soliciting and selecting research proposals, assisting in financing them, and publishing the results in coordination with ACI technical committees. Through the program, grants of up to \$50,000 will be awarded to research that advances the knowledge and sustainability of concrete materials, construction, and structures.

Awards: Up to \$50,000; The ACI Foundation will also cover up to an additional 15% of the direct cost for institution overhead.

Proposal Deadline: December 2, 2019

Streamlyne Question of the Week

Question: How do I search for a document in Streamlyne?

Answer: Streamlyne Research search features are accessible from the Menu Bar, from the Main Menu, and from within documents. (Page 19 of the New User Manual posted on the Research website <http://www.njit.edu/research/sites/research/files/StreamlyneNewUserManualCommonElements.pdf>).

Searching Across All Modules: In any Streamlyne Research module, please click the magnifying glass on the Menu Bar to access the Document Lookup. This will open up a form to search for any document in any Streamlyne Research module, regardless of whether the document is delivered or customized.

Searching Within a Module: If you would like to search for a document specific to a given module, click the hyperlinked menu option from the Main Menu. Streamlyne Research will direct you to a Lookup form that searches specifically for documents within the module selected.

Searching at the Field Level: Whether you are looking for a data element within a document section or trying to narrow down search criteria, you may search for a specific value by clicking the magnifying glass next to any field. If a magnifying glass does not appear next to a field, it means that the entries for this field are not limited to a set of configured values, and therefore cannot be accessed using the Lookup function.

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

Streamlyne Information

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.

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

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

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

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

Iris Pantoja, NCE, CoAD and MTSM Project Manager; 973-596-4483; irp3@njit.edu

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
(new time slot for FY2020)

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.
