NJIT Research Newsletter

Issue: ORN-2019-43

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

Special Announcements

Reminder: Internal Timeline for Successful and Timely Proposal Submission

Recently federal agencies including NSF, NIH and DoE/DoD have emphasized and requested Principal Investigators and institutions to submit their proposals well before the posted deadline to avoid unexpected problems in online submissions with respect to system error checks and additional needs of subsequent revisions.

For example, NSF clearly stated during the CAREER program webinar held on May 9, 2019 posted on https://www.nsf.gov/career that any response from help desk within the last four days of the deadline may not be provided on the same day. NSF warned that the **questions related to errors and other proposal submission issues in the last 72 hours before the deadline may not be answered on time for submission.**

All NIH RFP announcements with a due date include the following statement: "***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."***

The DoE Funding Opportunities (https://science.osti.gov/ber/Funding-Opportunities) include the following reminder for all funding opportunity announcements: "***Reminder: Submit letters of intent, preapplications, and applications well ahead of stated deadlines."***

The NJIT Proposal Submission Guidelines and Policy posted on the website https://research.njit.edu/research-policies provides the institutional timeline in order to help faculty and staff Principal Investigators for successful proposal submission. We are requesting all Principal

Investigators, faculty, staff and administration to follow the proposal submission to help everyone to submit a successful proposal on time, preferably before the deadline as requested by federal funding agencies. The following are the NJIT Proposal Submission Guidelines modified for Straemlyne proposal submission system:

- **1 month (or earlier) before the due date**: initiate the proposal submission process in Streamlyne with a notice of intent to apply to college POC and SRA including the request for proposal identification number (NSF, NIH) and/or the RFP document. This is an important step that will help the College POC and SRA to manage your proposals. It will allow:
    - preliminary review of needs and sponsor requirements (meeting recommended)
    - set up the timeline in motion and internal checklist/deadlines
    - collaborator outreach and intake requirements (where applicable)
    - set up the budget and Streamlyne document development process including any cost-sharing for consideration of department, college and office of research administration.
- **1 month - 2 weeks before due date:** the budget should be finalized and the approval process should be initiated**.** This includes the department and college approvals, conflict of interest forms, the detailed budget and justification, proposal title, and preliminary specific aims (NIH), proposal summary (NSF), or contract scope of work (SOW). The following checklist should be followed:
    - Proposal budget
        - Internal budget commitments such as cost-sharing should be fully calculated/loaded at this time. Any college specific internal process for index source and approvals should be followed within this timeline.
    - Complete initial proposal details and internal Streamlyne information
    - Complete Streamlyne questionnaires
        - Proposal specific
        - Sponsor specific (as applicable for grants.gov for S2S submission)
    - Complete special review disclosures (as applicable)
        - IRB/human subjects
        - Biosafety
        - Animals
        - Export Controls
        - Conflict of Interest
- **2 weeks - 1 week before the due date:** submit all required internal attachments including:
    - Project Summary/Statement of Work
    - Final Budget
    - Budget Justification
    - For S2S Proposals – Complete additional input of placeholder attachments.
    - Submit in Streamlyne and monitor routing/review by key personnel and department/college administration.
- **72 hours – 24 hours before the submission deadline:** Prepare the final version for submission. The following actions will be managed during this period.
    - All final technical documents/attachments are completed and validated in internal and/or sponsor system(s).
    - Central Office completes final review and coordination with PI and College POC on final proposal review, validation of system requirements and engages in sponsor actions and submission.
    - Central office completes internal data and archiving procedures and coordinates follow-up

- **At least 24 hours before the submission deadline:** The PI should release the final version of the proposal to the SRA office at least 24 hours prior to the deadline for on-time submission.

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

NCE: John McCarthy, NCE Director of Research; (973) 596-3247; john.p.mccarthy@njit.edu
NCE: Deidra Slough, Grant Management Specialist, (973)-596-3428; deidra.l.slough@njit.edu

CSLA: Cristo Leon, CSLA Director of Research; (973) 596-6426; cristo.e.yanezleon@njit.edu
CSTR: Felicia Margolies, Project Manager, (973)-596-5377 felicia.h.margolies@njit.edu

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

HCoAD and MTSM: Interim POC: Justin Samolewicz, Director (Pre Award); (973)-596-3145; justin.m.samolewicz@njit.edu**; Iris Pantoja**, Project Manager; 973-596-4483; irp3@njit.edu (on maternity leave)

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

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2019 NJIT Research Institutes, Centers and Laboratories Showcase and President's Forum
November 14, 2019; Ballroom A/B, Campus Center; 10.00 AM – 2.00 PM

We are pleased to announce 2019 NJIT Research Institutes, Centers and Laboratories Showcase and President's Forum on November 14, 2019 from 10.00 AM to 2.00 PM in Ballroom A/B at the Campus Center. Dr. Vipin Chaudhary, Program Director, National Science Foundation and SUNY Empire Innovation Professor, State University of New York (SUNY) – Buffalo will be the Keynote Speaker at the President's Forum and 2019 NJIT Research Institutes, Centers and Laboratories Showcase.

Following the *2020 Vision* strategic plan, NJIT research enterprise has grown significantly with a total research expenditure of nearly $170 million in FY2019. With the recent growth in research and development synergy, NJIT has been elevated to an "R1" institution by the Carnegie Classification of Institutions of Higher Education. The 2019 NJIT Research Institutes, Centers and Laboratories Showcase will feature more than 110 research institutes, centers and specialized laboratories at the President's Forum on November 14, 2019.

All faculty, researchers and students are invited to join us at the 2019 NJIT Research Institutes, Centers and Laboratories Showcase to network and celebrate the research synergy and accomplishments of NJIT faculty, students and researchers. Please encourage your students, post-docs and researchers to attend and participate. The program agenda is as follows.

Agenda

10.00 AM – 10.15 AM:	Welcome Remarks and Introduction to the Keynote Speaker Atam Dhawan, Senior Vice Provost for Research Announcement of NJIT Institute of Data Science (IDS)

10.15 AM – 11.15 AM:	IDS Vision: Dr. David Bader, Distinguished Professor and Director, IDS President's Forum Keynote Talk: Four Decades of HPC: Architectures, Programming Environments, Systems, and Applications Speaker: Dr. Vipin Chaudhary, Program Director, National Science Foundation and SUNY Empire Innovation Professor, State University of New York (SUNY) – Buffalo
11.15 AM – 12.15 PM:	Networking and e-Poster Session-1
12.15 PM – 1.00 PM:	Lunch and Networking Session
1.00 PM – 2.00 PM:	Networking and e-Poster Session-2

Keynote Talk: Four Decades of HPC: Architectures, Programming Environments, Systems, and Applications

Speaker: Dr. Vipin Chaudhary, Program Director, National Science Foundation and SUNY Empire Innovation Professor, State University of New York (SUNY) – Buffalo

Abstract: High performance computing (HPC) impacts every aspect of scientific endeavor. In this talk I will cover various HPC problems and applications over four decades from my journey in academia and industry. These include new multi-(many) core processors and interconnection networks, parallelizing compilers for non-uniform dependences, OpenMP for heterogeneous processors, Virtual Machines for HPC, multi-threaded embedded operating systems, accelerating bioinformatics algorithms using FPGAs and GPUs, hyper-converged computer systems and variable redundancy for flash storage arrays, and machine learning. I will describe applications of HPC in surgery and medical diagnosis and the future challenges in HPC. Additionally, I will discuss some of the new funding opportunities within the NSF Office of Advanced Cyberinfrastructure.

Speaker's Bio: A veteran of High Performance Computing (HPC), Dr. Chaudhary has been actively participating in the science, business, government, and technology innovation frontiers of HPC for over three decades. His contributions range from heading research laboratories and holding executive management positions, to starting new technology ventures. Vipin Chaudhary is the SUNY Empire Innovation Professor of Computer Science and Engineering at SUNY Buffalo, and the co-founder of the Center for Computational and Data-Enabled Science and Engineering. He is currently on an IPA appointment at the National Science Foundation where he is serving as a Program Director in the NSF Office of Advanced Cyberinfrastructure. He co-leads the National Strategic Computing Initiative from NSF for the United States and is in the working group of the Quantum Leap Initiative and the I-Corps Program. He is also in the working group of the Interagency Modeling and Analysis Group. He cofounded Scalable Informatics, a leading provider of pragmatic, high performance software-defined storage and compute solutions to a wide range of markets, from financial and scientific computing to research and big data analytics. From 2010 to 2013, Dr. Chaudhary was the Chief Executive Officer of Computational Research Laboratories (CRL) where he grew the company globally to be an HPC cloud and solutions leader before selling it to Tata Consulting Services. Prior to this, as Senior Director of Advanced Development at Cradle Technologies, Inc., he was responsible for advanced programming tools for multi-processor chips. He was also the Chief Architect at Corio Inc., which had a successful IPO in July 2000 and later sold to IBM.

This President's forum is a featured event in the Albert Dorman Honors College Colloquium Series and is made possible in part by the generous support of the DeCaprio Family.

Ongoing Reviews on US Policies on Research Protection, Foreign Gifts, Foreign Influence and International Collaborations
Concerns: Research Protection: Information Access, Data Sharing, IP and Security

Federal Agencies Involved Along with Congressional Committee: DoD, NSA, NSF, NIH, DoE,…
Universities Associations Involved: APLU, AAU

NSF Dear Colleague Letter by Director France Cordova (July 11, 2019; https://www.nsf.gov/pubs/2019/nsf19200/research_protection.jsp):

Our science and engineering enterprise, however, is put at risk when another government endeavors to benefit from the global research ecosystem without upholding the values of openness, transparency, and reciprocal collaboration. Faced with such a risk, we must respond.

To streamline the process for providing these disclosures to NSF, we are proposing use of an ***electronic format for submission of biographical sketches, including disclosure of all appointments. As currently envisioned, this will become effective in January 2020.*** *We are also working to develop an electronic format for disclosure of current and pending support information.*

Finally, we are issuing a policy making it clear that NSF personnel and IPAs detailed to NSF cannot participate in foreign government talent recruitment programs. There is a risk that participation in foreign government talent recruitment programs by NSF personnel and IPAs will compromise the ethical principles that bind us. ***Moreover, such participation poses significant risks of inappropriate foreign influence on NSF policies, programs, and priorities, including the integrity of NSF's merit review process—risks we simply cannot accept.***

DOD Undersecretary Addresses Academic Community on Science & Security
On October 10, Michael D. Griffin, Department of Defense (DOD) Undersecretary for Research and Engineering, released a **letter** addressed to the academic community describing threats to our collaborative research environment by foreign governments and outlining steps taken by DOD and other federal agencies to protect the integrity of the research enterprise. The letter also highlights ongoing activities by APLU and other higher education associations to mitigate threats.

Actions Taken by Universities to Address Growing Concerns about Security Threats and Undue Foreign Influence on Campus ***APLU and AAU Document: Effective Policies and Practices document***

Grant Opportunity Alerts

Keywords and Areas Included in the Grant Opportunity Alert Section Below

NSF: Cyberinfrastructure Centers of Excellence (CI CoE); Navigating the New Arctic (NNA); Understanding the Rules of Life: Microbiome Theory and Mechanisms (URoL:MTM); Understanding the Rules of Life: Epigenetics; Addressing Systems Challenges through Engineering Teams (ASCENT); NSF Directorate for Engineering - UKRI Engineering and Physical Sciences Research Council Lead

Agency Opportunity (ENG-EPSRC); Frontier Research in Earth Sciences (FRES); Biology Integration Institutes (BII); Campus Cyberinfrastructure (CC*); Macrosystems Biology and NEON-Enabled Science (MSB-NES); Transitions to Excellence in Molecular and Cellular Biosciences Research (Transitions); National Artificial Intelligence (AI) Research Institutes; Division of Environmental Biology (DEB)
NIH: NCI Small Grants Program for Cancer Research; NIDCR Research Grants for Analyses of Existing Genomics Data (R01); NCMRR Early Career Research Award (R03 Clinical Trial Optional); NINDS Ruth L. Kirschstein National Research Service Award (NRSA) for Training of Postdoctoral Fellows (F32); NIH Blueprint for Neuroscience Research Education Program on Translational Devices (R25); NIDCR Small Grant Program for New Investigators (R03)
Department of Defense/US Army/DARPA/ONR: Air Superiority Technology Broad Agency Announcement; NRL Long Range Broad Agency Announcement (BAA) for Basic and Applied Research; DSO Office-wide Broad Agency Announcement
Department of Transportation: Grants or Research Fellowship (GRF)
Department of Agriculture: REAP-Renewable Energy Systems and Energy Efficiency Improvements
Department of Labor: Apprenticeships: Closing the Skills Gap
EPA: Solid Waste Recycling Enhancement Act (REA) Higher Education Research Grant Program; People, Prosperity and the Planet (P3) Student Design Competition
Department of Energy: FY 2020 Solicitation for the Office of Science Financial Assistance Program; Environmental System Science; Generating Electricity Managed by Intelligent Nuclear Assets (GEMINA); Performance-Based Energy Resource Feedback, Optimization, And Risk Management; Stewardship Science Academic Alliances (SSAA) Program
NASA: ROSES 2019: Advancing Collaborative Connections for Earth System Science; Future Investigators in NASA Earth and Space Science and Technology; Heliophysics System Observatory Connect; Research Opportunities in Space and Earth Sciences: Astrophysics Science SmallSat Studies; Use of the NASA Physical Sciences Informatics System
National Endowment of Humanities: Digital Humanities Advancement Grants; Collaborative Research
Brain Research Foundation: Brain Research Foundation (BRF) Seed Grant

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Recent Research Grant and Contract Awards

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

PI: Gary Dale (PI) and Bin Chen (Co-PI)
Department: Center for Solar Terrestrial Research
Grant/Contract Project Title: Microwave Imaging Spectroscopy Support for Parker Solar Probe
Funding Agency: NASA
Duration: 10/11/19-10/10/21

PI: Xinyue Ye (PI)
Department: Informatics
Grant/Contract Project Title: Convergence Accelerator Phase I (RAISE): Open Knowledge Network for Spatial Decision Support
Funding Agency: NSF
Duration: 09/01/19-05/31/20

In the News…

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

Scientists Seek Clarity Amid US Security Push: U.S. science agencies are leaning on disclosure requirements to identify individuals with problematic ties to foreign governments, but uncertainty remains about the scope of the policies and the potential for follow-on actions, especially as they relate to collaborations with China. Recently, agencies have been coordinating their efforts through the Joint Committee on the Research Environment (JCORE), which the White House stood up in May to address a variety of high-priority issues. This week, the committee held a summit at the White House with leaders of the scientific community to gather feedback on questions concerning research integrity and security, among other topics.

As agencies work to shore up their procedures, their efforts have created considerable consternation in the scientific community, including among organizations deeply engaged with policy. For instance, the Council on Governmental Relations, a university association, has argued that a "clarification" the National Science Foundation has proposed to its disclosure policy "differs dramatically from common interpretation of previous guidance" and could entail substantial administrative burden. A report on a meeting on November 5 is posted on the website https://www.aip.org/fyi/2019/scientists-seek-clarity-amid-us-security-push

Ecosystem Processes: DOE plans to spend $10 million on coupling observational and experimental research with model development. "Research under this initiative will focus on such topics such as the interactions between soils and vegetation, atmospheric fluxes over wetlands and coastal systems, and the complex processes taking place within integrated watersheds. By combining experiment, observation, and model development, teams of scientists will seek to unravel these complex processes and improve the ability of models to represent them." Applications will be open to universities, industry, and nonprofit research institutions as the lead institution, with possible collaborators at the DOE National Laboratories and other federal agencies. Funding is to be awarded competitively, on the basis of peer review, and is expected to be in the form of two- to three-year grants. Funding opportunities are listed on the website https://science.osti.gov/ber/Funding-Opportunities.

Quantum Information Science: Applications, Global Research and Development, and Policy Considerations: Combining elements of mathematics, computer science, engineering, and physical sciences, quantum information science (QIS) has the potential to provide capabilities far beyond what is possible with the most advanced technologies available today. Quantum science, generally, is the study of the smallest particles of matter and energy; QIS builds on quantum science principles to obtain and process information in ways that cannot be achieved based on classical physics principles. QIS is based on the premise that information science depends on quantum effects in physics. The advantages to using QIS in certain circumstances can be illustrated by the example of quantum computing. Quantum computing is not just "faster" than classical computing. It is not useful for many types of problems where a classical supercomputer would excel. However, there are certain tasks for which the power of quantum computing is unmatched, such as code breaking. This power is derived from quantum computing's use of "qubits" or "quantum bits." Although much of the press coverage of QIS has been devoted to quantum computing, there is more to QIS. Many experts divide QIS technologies into three application areas: • Sensing and metrology, • Communications, and • Computing and simulation. A report is posted on the website https://crsreports.congress.gov/product/pdf/R/R45409.

Field Hearing: Smart Mobility: It's A Community Issue: Raj Rajkumar, professor of electrical and computer engineering at Carnegie Mellon, explained at a House Science, Space, and Technology Committee field hearing. The AI Stack captures the core enabling technologies that underpin smart city innovation. The "computing" and "devices" layers capture advances in computing power, innovations in the cost and effectiveness of networking technology, as well as sensing capabilities for perception such as LIDAR sensors ("Light Detection and Ranging," a remote sensing method that uses light in the form of a pulsed laser to measure distance).
The "machine learning" layer represents the data science elements of the Stack, including innovations in collecting and managing big data, increasingly at the hardware level and in cloud-computing operations. The "modeling," "decision support" and "planning & acting" elements of the Stack incorporate algorithmic advances for translating data analytics into recognizable patterns for prediction. These combined capabilities then facilitate action---- either by autonomous systems, humans, or even better a combination of the two working together. Such autonomous systems range from autonomous vehicles and automated building systems to cognitive assistance tools such as advanced traffic, public health notices or data-informed strategies for optimizing infrastructure repairs. Finally, as the AI Stack diagram highlights, the design and application of research in these domains must be informed by policy and ethics considerations across all these technology layers. The testimony is posted on the website https://science.house.gov/imo/media/doc/Rajkumar%20Testimony.pdf

R&D Spending Budget: On October 31, a month into the new fiscal year, the Senate finally passed the first set of FY 2020 appropriations bills. In a bipartisan vote of 84-9, the Senate passed a $214 billion spending package that contained four appropriations bills—Agriculture, Interior-Environment, Commerce-Justice-Science, and Transportation-Housing and Urban Development. All four had advanced through the Senate Appropriations Committee with unanimous approval. The only two other bills that advanced unanimously were Energy and Water and Financial Services and there are efforts to bring these two bills to the floor for a vote to continue making progress. The report is posted on the website https://drive.google.com/file/d/1XJl4VfSAfuBu4F5zYoiYd3oQY4-6SWLL/view.

Testing Self-Driving Vehicles: "Attendees agreed that simulation, test track, and on-road testing may all be necessary for the development of self-driving technology. Some suggested that a minimum set of requirements and guidelines could be established," according to a report of a workshop held by the National Institute of Standards and Technology. **The workshop** considered a range of safety issues. The workshop report is posted on the website https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.1900-320.pdf

***IBM, Google Debate Over What Quantum Supremacy Means.* ZDNet (10/30, Ray)** discusses what the debate between Google and IBM over "quantum supremacy" means. Over the past two weeks, the companies have fought over the term, with Google saying "it's about the physics of making a superior device," whereas IBM claims that "'architecture,' the design of a traditional computer system, still has amazing potential to advance computing." Last week, Google revealed "the results of its 'Sycamore' superconducting computer chip, which was able to measure the output of a random number generator one million times in roughly three minutes versus what Google estimated would take 10,000 years to do using a conventional electronic or a 'classical' computer." IBM, conversely, stated that "Google hadn't achieved quantum supremacy" because "in theory, a supercomputer using conventional electronics could do the task not in 10,000 years but two and a half days." The company is arguing that "the architecture...can be done more intelligently to get around bottlenecks – in this case, a lack of sufficient DRAM in each compute node with which to work on the intermediate products of matrix math."

White House Releases Strategic Implementation Plan on STEM Diversity: The Strategic Plan presents a vision for a future where all Americans will have lifelong access to high quality STEM education and the United States will be the global leader in STEM literacy, innovation, and employment. It is intended to serve as a "North Star" for the broader STEM community as it collectively charts a course for the Nation's success and is responsive to the requirements of Section 101 of the America COMPETES Reauthorization Act of 2010.

Three goals are being actively pursued to support the Strategic Plan's overarching vision:

- Build Strong Foundations for STEM Literacy by ensuring that every American has the opportunity to master basic STEM concepts and to become digitally literate.
- Increase Diversity, Equity, and Inclusion in STEM and provide all Americans with lifelong access to high-quality STEM education, especially those historically underserved and underrepresented in STEM fields and employment.
- Prepare the STEM Workforce for the Future—both college-educated STEM practitioners and those working in skilled trades that do not require a four-year degree—by creating authentic learning experiences that encourage and prepare learners to pursue STEM careers.

The Strategic Plan is organized around four pathways, representing a cross-cutting set of approaches to improve STEM education that will help fulfill its vision and achieve its three goals:

- Develop and Enrich Strategic Partnerships – Strengthen relationships between educational institutions, industry, community organizations to leverage resources for the purpose of providing the student with meaningful learning opportunities.
- Engage Students where Disciplines Converge – Draw on knowledge and methods across disciplines to solve complex, real world problems in STEM using innovation, creativity, and initiative.
- Build Computational Literacy – Design integrated approaches to teaching and learning computational thinking and promote digital literacy and cyber safety.
- Operate with Transparency and Accountability – Develop and apply metrics that assess progress in meaningful ways and disseminate them to external stakeholders.

Webinar and Events

Event: Institute for Space Weather Sciences: Distinguished Speakers Series
Title: Journey to the Sun
Speaker: Dr. Nicola Fox, NASA
Place: 112 Eberhardt Hall, NJIT
Time: Monday, Nov. 11, 2019; 11:45 am to 1:00 pm (Refreshment at 11:30)

Abstract: NASA Heliophysics research studies a vast system stretching from the Sun to Earth to far beyond the edge of the planets. Studying this system – much of it driven by the Sun's constant outpouring of solar wind -- not only helps us understand fundamental information about how the universe works, but also helps protect our technology and astronauts in space. NASA seeks knowledge of near-Earth space, because -- when extreme -- space weather can interfere with our communications, satellites and power grids. The study of the Sun and space can also teach us more about how stars contribute to the habitability of planets throughout the universe. Mapping out this interconnected system requires a holistic study of the Sun's influence on space, Earth and other planets. NASA has a fleet of spacecraft strategically placed throughout our heliosphere: -- from Parker Solar Probe at the Sun observing the very start of the solar

wind, to satellites around Earth, to the farthest human-made object, Voyager, which is sending back observations on interstellar space; -- all helping us untangle the effects of the star we live with.
Brief Bio: Dr. Nicola Fox is the Heliophysics Division Director in the Science Mission Directorate at NASA Headquarters in Washington, DC. Until August 2018, Fox worked at the Applied Physics Lab at the Johns Hopkins University where she was the chief scientist for Heliophysics and the project scientist for NASA's Parker Solar Probe. Fox served as the deputy project scientist for the Van Allen Probes, and the operations scientist for the International Solar Terrestrial Physics program. Fox received her BS in Physics and PhD in Space and Atmospheric Physics from the Imperial College of Science, Technology and Medicine in London. She received an MS in Telematics and Satellite Communications from the University of Surrey.

Event: PAESMEM Applicant Webinars
Sponsor: NSF
When: November 19, 2019 2:00 PM - 3:00 PM
Website: https://www.nsf.gov/events/event_summ.jsp?cntn_id=299253&org=NSF
Brief Description: NSF is offering a webinar on October 31, 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: The End of the Road for General Purpose Processors & the Future of Computing
Sponsor: NSF
When: November 22, 2019; 1.00 PM – 2.00 PM
Website: https://www.nsf.gov/events/event_summ.jsp?cntn_id=299532&org=NSF
Brief Description: After 40 years of remarkable progress in general-purpose processors, a variety of factors are combining to lead to a much slower rate of performance growth in the future. These limitations arise from three different areas: IC technology, architectural inefficiencies, and changing applications and usage. The end of Dennard scaling and the slowdown in Moore's Law will require much more efficient architectural approaches than we have relied on. Although progress on general-purpose processors may hit an asymptote, domain specific architectures may be the one attractive path for important classes of problems, at least until we invent a flexible and competitive replacement for silicon.
To Join the Webinar: Please register at: https://www.tvworldwide.com/events/nsf/191122/ to view the 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.

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

Workshop participation will be by invitation, based on applications, and limited to 300 participants who will be selected from the pool of applicants based on: a) applicability of the proposed research to the Directorate for Engineering, b) timeliness and completeness of the application, and c) preference given to those who have not previously attended an NSF Engineering CAREER workshop. Please review the application page for further information.
Cost: NSF has provided partial funding for the workshop. Those individuals selected to participate will be required to submit a workshop registration fee of $500. Workshop attendees are responsible for their travel, lodging, and expenses. There will be a limited number of $1,000 travel grants available to participants to help defray the cost of travel.
Application Deadline: January 6, 2020
Registration Deadline: February 14, 2020
Agenda: 2020 NSF ENG CAREER Proposal Writing Workshop
Crystal Gateway Marriott
1700 Richmond Hwy, Arlington, VA 22202
March 31 – April 2, 2020
Tuesday
Networking Reception, 5PM – 7PM
Wednesday
Workshop Day 1, 7:00AM – 5PM
Thursday
Workshop Day 2, 7:00AM – 2PM
To Apply and Register: Submit your application at
https://nsfengcareerworkshop.ccny.cuny.edu/application-will-be-available-on-october-28-2019/

Grant Opportunities

National Science Foundation

Grant Program: Cyberinfrastructure Centers of Excellence (CI CoE)
Agency: National Science Foundation NSF PD 20-139Y
RFP Website:
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505744&org=NSF&sel_org=NSF&from=fund
Brief Description: The Nation's advanced research cyberinfrastructure (CI) ecosystem catalyzes discovery and innovation across all areas of science and engineering (S&E) research and education. The increasingly complex and rapidly evolving S&E landscape requires ***an agile, integrated, robust,***

trustworthy, and sustainable CI ecosystem that will drive new thinking and transformative discoveries in all areas of research and education.

The success of this vision depends on the ability of the research community to be able to easily and effectively access and use state-of-the-art research CI resources and services in a timely way. This, in turn, drives a set of requirements on the development, operation, and evolution of the CI ecosystem. First, research CI resources and services must be designed to leverage and drive innovations, and they must be user-centric and interoperable to enable the efficient, flexible end-to-end discovery pathways that are increasingly essential for the conduct of research. Second, the information, expertise, and services needed to maximally utilize the CI ecosystem must be disseminated broadly and concertedly to the research community.

The NSF Cyberinfrastructure Centers of Excellence (CI CoE) Program aims to realize the above vision by supporting hubs of expertise and innovation targeting specific areas, aspects, or stakeholder communities of the research CI ecosystem. Supported CI CoEs provide expertise and services related to CI technologies and solutions; gather, develop, and communicate community best practices; and serve as readily-available resources for both the research community and the CI community. A key objective of this program is to support CI CoEs that drive advancements in and positively impact the CI ecosystem through structured but strongly community-engaging and community-serving approaches. Overall, CI CoEs are a means of concentrating resources on a specific area of identified need in support of the broader goal of advancing capabilities and performance of the national CI ecosystem [https://trustedci.org/].

Awards: Standard grants.

Letter of Intent: Not Required**.** Individuals interested in submitting a proposal for a CI CoE project must first discuss their project idea with the cognizant CI CoE Program Director(s) in the relevant areas prior to submission and indicate the occurrence of such a discussion as a Supplementary Document in the eventual proposal. Proposals submitted without such documented prior discussion will be returned without review.

Proposal Submission Deadline: Full Proposal Accepted Anytime

Contacts: William L. Miller wlmiller@nsf.gov (703) 292-7886

Grant Program: Navigating the New Arctic (NNA)

Agency: National Science Foundation NSF 20-514

RFP Website: https://www.nsf.gov/pubs/2020/nsf20514/nsf20514.htm

Brief Description: In 2016, the National Science Foundation (NSF) unveiled a set of "Big Ideas," 10 bold, long-term research and process ideas that identify areas for future investment at the frontiers of science and engineering. The Big Ideas represent unique opportunities to position our Nation at the cutting edge of global science and engineering leadership by bringing together diverse disciplinary perspectives to support convergence research. As such, when responding to this solicitation, even though proposals must be submitted to the Directorate for Geosciences, once received, the proposals will be managed by a cross-Directorate team of NSF Program Directors.

Major goals of NSF's NNA Big Idea include:

- Improved understanding of Arctic change and its local and global effects that capitalize on innovative and optimized observation infrastructure, advances in understanding of fundamental processes, and new approaches to modeling interactions among the natural environment, built environment, and social systems.
- New and enhanced research communities that are diverse, integrative, and well-positioned to carry out productive research on the interactions or connections between natural and built environments and social systems and how these connections inform our understanding of Arctic change and its local and global effects.

- Research outcomes that inform national security, economic development, and societal well-being, and enable resilient and sustainable Arctic communities.
- Enhanced efforts in formal and informal education that focus on the social, built, and natural impacts of Arctic change on multiple scales and broadly disseminate research outcomes.

This solicitation requests proposals that fall within two tracks. Track 1 supports research activities, while Track 2 is dedicated to planning grants to develop convergence research teams to tackle projects of larger scope in the future. This solicitation is the second of what is envisioned to be at least a five-year agency-wide program to support the research and dissemination of new knowledge needed to inform the economy, security, and resilience of the Nation, the larger Arctic region, and the globe with respect to Arctic change. NSF anticipates that future calls will further define "larger scope," with the potential to include projects up to the scale of centers and/or consortia.
Awards: Standard grants. Anticipated Funding Amount: $30,000,000
Letter of Intent: Not Required
Proposal Submission Deadline: February 11, 2020
Contacts: NNA Working Group, telephone: (703) 292-8030, email: nna@nsf.gov

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Grant Program: Understanding the Rules of Life: Microbiome Theory and Mechanisms (URoL:MTM)
Agency: National Science Foundation NSF 20-513
RFP Website: https://www.nsf.gov/pubs/2020/nsf20513/nsf20513.htm
Brief Description: *Understanding the Rules of Life (URoL): Predicting Phenotype* is one of NSF's 10 big ideas (https://www.nsf.gov/news/special_reports/big_ideas/) and is focused on predicting the set of observable characteristics (phenotypes) based on the genetic makeup of the individual and the nature of its environment. The Understanding the Rules of Life: Microbiome Theory and Mechanisms (URoL:MTM) program is an integrative collaboration across Directorates and Offices within the National Science Foundation. The objective of URoL:MTM is to understand and establish the theory and mechanisms that govern the structure and function of microbiomes, a collection of microbes in a specific habitat/environment. This may include but is not limited to host-associated microbiomes, such as those with humans and other organisms, where i) the microbiome impacts host physiology, behavior, development, and fitness; ii) the host influences the metabolic activity, dynamics and evolution of the microbiome, and iii) the environment (biological, chemical, physical, and social) influences and is influenced by both the host and the microbiome.
The URoL:MTM program invites integrated, interdisciplinary proposals that develop theoretical predictive frameworks with well-designed experimental and/or computational approaches to generate and test hypotheses about the causal relationships within the microbiome, and among the microbiome, host, and environment. How these relationships affect robustness, resilience, and adaptability of individual organisms, populations, and communities are also of interest. Projects may apply existing ecological and evolutionary theory or develop new experimental, computational, or mathematical tools, models, and theory to: i) explain function and interactions in natural, experimental, and model microbiomes; ii) elucidate the molecular mechanisms that underlie communication between the host and the microbiome and among the members of the microbiome; and/or iii) comparatively analyze microbiomes to discover emergent properties that provide insight into the behavior of living systems.
Successful projects will contribute to a portfolio of research that identifies general principles ("rules") that underlie a wide spectrum of biological phenomena across spatial, temporal (from sub-second to geologic), and/or complexity (molecular, cellular, organismal, population) scales. URoL:MTM projects must integrate perspectives and research approaches from more than one research discipline (e.g., biology, chemistry, computer science, engineering, geosciences, mathematics, physics, social and behavioral

sciences). They must also incorporate best practices regarding protocol documentation, sample selection, data collection and analysis, model/algorithm development, as well as data sharing and accessibility. The interdisciplinary scope of URoL:MTM projects should provide unique training and outreach opportunities to train the next generation of scientists in a diversity of scientific approaches and to engage society more generally.

Awards: Standard grants. URoL:MTM supports basic science research projects of different scales and scope. The URoL:MTM Program offers two submission tracks: Track 1 for projects with a total budget of up to $500,000 and an award duration of up to 3 years and Track 2 for projects with a total budget of up to $3,000,000 and award duration of up to 5 years. Anticipated Funding Amount: $12,000,000 to $15,000,000

Letter of Intent: Required**; Due: January 17, 2020**

Proposal Submission Deadline: March 02, 2020

Contacts: Catalina Achim, MPS, telephone: (703) 292-2048, email: microbiome@nsf.gov

Soo-Siang Lim, SBE, telephone: (703) 292-7878, email: microbiome@nsf.gov

Robert Mayes, EHR, telephone: (703) 292-7267, email: microbiome@nsf.gov

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Grant Program: Understanding the Rules of Life: Epigenetics

Agency: National Science Foundation NSF 20-512

RFP Website: https://www.nsf.gov/pubs/2020/nsf20512/nsf20512.htm

Brief Description: *Understanding the Rules of Life (URoL): Predicting Phenotype* is one of NSF's 10 Big Ideas and is focused on predicting the set of observable characteristics (phenotype) from the genetic makeup of the individual and the nature of its environment. The development of new research tools has revolutionized our ability to manipulate and investigate the genome and to measure multiple aspects of biological, physical, and social environments. The opportunity now is to assimilate this new information into causal, mechanistic, and/or predictive relationships among the genomic and epigenetic makeup, the environmental experience, and the phenotypic characteristics of biological systems. These relationships are the basis for the Rules of Life – the theoretical constructs that explain and predict the characteristics of living systems, from molecular and sub-cellular components, to cells, whole organisms, communities and biomes.

The recognition that heritable phenotypic properties can occur without modification of an organism's genome sequence is changing the understanding of the way heritable traits come about and manifest themselves as observable phenotypes within a particular static or changing environmental context. The impact of epigenetic inheritance occurs at the molecular, cellular, and organismal scales, and may have profound consequences for the higher-order organization of living systems, including populations, communities, and ecosystems.

Successful projects of the URoL:Epigenetics Program are expected to use complementary, interdisciplinary approaches to investigate how epigenetic phenomena lead to emergent properties that explain the fundamental behavior of living systems. Ultimately, successful projects should identify general principles ("rules") that underlie biological phenomena within or across scales of size, complexity (e.g., molecular, cellular, organismal, population) and time (from sub-second to geologic) in taxa from anywhere within the tree of life, including humans. **URoL:Epigenetics projects must integrate perspectives and research approaches from more than one research discipline (e.g., biology, chemistry, computer science, engineering, geology, mathematics, physics, social and behavioral sciences).** The interdisciplinary scope of URoL:Epigenetics projects also provides unique training and outreach possibilities to train the next generation of scientists in a diversity of approaches and to engage society more generally.

Awards: Standard grants. Anticipated Funding Amount: $12,000,000 to $15,000,000

Letter of Intent: Required; Due: December 20, 2019
Proposal Submission Deadline: February 06, 2020
Contacts: Mitra Basu, CISE, telephone: (703) 292-8649, email: epigen@nsf.gov

Rebecca Ferrell, SBE, telephone: (703) 292-7850, email: epigen@nsf.gov
Karla Heidelberg, GEO, telephone: (703) 292-2586, email: epigen@nsf.gov

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Grant Program: Addressing Systems Challenges through Engineering Teams (ASCENT)
Agency: National Science Foundation NSF 20-511
RFP Website: https://www.nsf.gov/pubs/2020/nsf20511/nsf20511.htm
Brief Description: The Electrical, Communications and Cyber Systems Division (ECCS) supports enabling and transformative engineering research at the nano, micro, and macro scales that fuels progress in engineering system applications with high societal impact. This includes fundamental engineering research underlying advanced devices and components and their seamless penetration in power, controls, networking, communications or cyber systems. The research is envisioned to be empowered by cutting-edge computation, synthesis, evaluation, and analysis technologies and is to result in significant impact for a variety of application domains in healthcare, homeland security, disaster mitigation, telecommunications, energy, environment, transportation, manufacturing, and other systems-related areas. ECCS also supports new and emerging research areas encompassing 5G and Beyond Spectrum and Wireless Technologies, Quantum Information Science, Artificial Intelligence, Machine Learning, and Big Data.
ECCS, through its ASCENT program, offers its engineering community the opportunity to address research issues and answer engineering challenges associated with complex systems and networks that are not achievable by a single principal investigator or by short-term projects and can only be achieved by interdisciplinary research teams. ECCS envisions a connected portfolio of transformative and integrative projects that create synergistic links by investigators across its three ECCS clusters: Communications, Circuits, and Sensing-Systems (CCSS), Electronics, Photonics and Magnetic Devices (EPMD), and Energy, Power, Control, and Networks (EPCN), yielding novel ways of addressing challenges of engineering systems and networks. ECCS seeks proposals that are bold and ground-breaking, transcend the perspectives and approaches typical of disciplinary research efforts, and lead to disruptive technologies and methods or enable significant improvement in quality of life.

- ASCENT supports fundamental research projects involving at least three collaborating PIs and co-PIs, up to four years in duration, with a total budget between $1 million and $1.5 million.
- ASCENT proposals must highlight the engineering leadership focus of the proposal within the scope of ECCS programs.
- ASCENT proposals must articulate a fundamental research problem with compelling intellectual challenge and significant societal impact. The topic at the heart of the proposal must lie within the scope of at least one of the three ECCS clusters (CCSS, EPMD, EPCN). Research proposals spanning multiple clusters are highly encouraged.
- ASCENT proposals must demonstrate the need for a concerted research effort by an integrated and interdisciplinary team, and strongly justify the interdisciplinary nature of the proposed work. They should include a timeline for research activities, with a strong justification of the explicit mechanisms for frequent communication between team members and effective assessment to achieve proposed goals.

Awards: Standard grants. Anticipated Funding Amount: $6,000,000 to $6,500,000
Letter of Intent: Required; Due: January 07, 2020
Proposal Submission Deadline: February 19, 2020

Contacts: Paul A. Lane, telephone: (703) 292-2453, email: plane@nsf.gov
Jenshan Lin, telephone: (703) 292-7950, email: jenlin@nsf.gov

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Grant Program: NSF Directorate for Engineering - UKRI Engineering and Physical Sciences Research Council Lead Agency Opportunity (ENG-EPSRC)
Agency: National Science Foundation NSF 20-510
RFP Website: https://www.nsf.gov/pubs/2020/nsf20510/nsf20510.htm
Brief Description: The Directorate for Engineering (ENG), Division of Chemical, Bioengineering, Environmental, and Transport Systems (CBET), the Division of Civil, Mechanical and Manufacturing Innovation (CMMI), and the Division of Electrical, Communications and Cyber Systems (ECCS) of the National Science Foundation and the Engineering, ICT and Manufacturing the Future Themes of the UK Engineering and Physical Sciences Research Council (EPSRC) are pleased to announce the ENG-EPSRC Lead Agency Opportunity. The goal of this opportunity is to reduce some of the barriers that researchers currently encounter when working internationally. The ENG-EPSRC Lead Agency Opportunity will allow US and UK researchers to submit a single collaborative proposal that will undergo a single review process.
Proposals will be accepted for collaborative research in areas at the intersection of CBET, CMMI, and/or ECCS with the EPSRC Engineering, ICT and/or Manufacturing the Future Themes. Proposers choose either NSF or EPSRC to serve as the "lead" agency to review their proposal. The non-lead agency will honor the rigor of the review process and the decision of the lead agency. For research teams that would like EPSRC to act as lead agency, please see the instructions at: https://epsrc.ukri.org/about/partner/international/agreements/nsf/.
Awards: Standard grants. Anticipated Funding Amount: $6,000,000
Letter of Intent: Not Required
Proposal Submission Deadline: Proposals Accepted Anytime
Contacts: Brandi Schottel, Division of Chemical, Bioengineering, Environmental, and Transport Systems (CBET), telephone: (703) 292-4798, email: bschotte@nsf.gov
Steven M. Zehnder, Division of Chemical, Bioengineering, Environmental, and Transport Systems (CBET), telephone: (703) 292-7014, email: szehnder@nsf.gov

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Grant Program: Frontier Research in Earth Sciences (FRES)
Agency: National Science Foundation NSF 20-509
RFP Website: https://www.nsf.gov/pubs/2020/nsf20509/nsf20509.htm
Brief Description: The FRES program will support research in Earth systems from the core through the critical zone. The project may focus on all or part of the surface, continental lithospheric, and deeper Earth systems over the entire range of temporal and spatial scales. FRES projects should have a larger scientific scope and budget than those considered for funding by disciplinary programs in the Division of Earth Sciences (EAR). FRES projects may be interdisciplinary studies that do not fit well within EAR's disciplinary programs or cannot be routinely managed by sharing between disciplinary programs . Innovative proposals within a single disciplinary area with outcomes of potential broad relevance to Earth Science research are also encouraged. Investigations may employ any combination of field, laboratory, and computational studies with observational, theoretical, or experimental approaches. Projects should be focused on topics that meet the guidelines for research funded by the Division of Earth Sciences.
Awards: Standard grants. Anticipated Funding Amount: $11,000,000 to $12,000,000
Letter of Intent: Not Required
Proposal Submission Deadline: February 05, 2020

Contacts: Dennis Geist, telephone: (703) 292-4361, email: fres@nsf.gov ; Margaret Fraiser, telephone: (703) 292-8172, email: fres@nsf.gov; Richard F. Yuretich, telephone: (703) 292-4744, email: fres@nsf.gov

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Grant Program: Biology Integration Institutes (BII)
Agency: National Science Foundation NSF 20-508
RFP Website:
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505684&org=NSF&sel_org=NSF&from=fund
Brief Description: In the last century, the study of biology has slowly fragmented into subdisciplines, creating a dynamic tension between unifying principles and increasingly reductionist pursuits. The aim of this solicitation is to bring researchers together around the common goal of understanding how the processes that sustain life and enable biological innovation operate and interact within and across different scales of organization, from molecules to cells, tissues to organisms, species, ecosystems, biomes and the entire Earth. The Biology Integration Institutes (BII) program supports collaborative teams of researchers investigating questions that span multiple disciplines within and beyond biology.

Integration across biological disciplines is essential if we hope to understand the diverse and ever-increasing data streams of modern biology and tackle emergent questions about living organisms and the environment. Of equal importance is the need for groundbreaking and sustainable training programs that prepare the next generations of scientists to navigate the breadth of biological sciences, training in multiple disciplines without sacrificing depth of learning or innovation. In addition, the biology community must continue to develop practices and adopt strategies that leverage rapid advances in cyberinfrastructure and other technologies to bridge and integrate across subdisciplines and make resources accessible, re-usable, and adaptable for unanticipated purposes. In these ways, BIO Integration Institutes will enable the discoveries of life's innovations that will inspire new applications to drive our bioeconomy and provide solutions to societal challenges.

While this solicitation focuses on the integration of biological disciplines, any field beyond biology may be included as needed to address the overarching biological theme. Proposals may be submitted in one of two tracks: (1) ***Design*** proposals are for teams to develop communities and groundbreaking ideas to be submitted to later competitions as Implementation proposals through diverse and sustained activities, including workshops and follow-up meetings. (2) ***Implementation*** proposals are for teams that have already a) developed an Integrative Research Plan around a theme of significance, b) designed an educational approach that employs effective methods for depth and breadth of training, AND c) prepared a cohesive and sustainable Management Plan that is ready for deployment.
Awards: Standard grants.
Letter of Intent: December 20, 2019
Proposal Submission Deadline: February 6, 2020
Contacts: Reed Beaman rbeaman@nsf.gov (703) 292-7163
Wilson Francisco wfrancis@nsf.gov (703) 292-7856

Grant Program: Campus Cyberinfrastructure (CC*)
Agency: National Science Foundation NSF 20-507
RFP Website: https://www.nsf.gov/pubs/2020/nsf20507/nsf20507.htm
Brief Description: The Campus Cyberinfrastructure (CC*) program invests in coordinated campus-level networking and cyberinfrastructure improvements, innovation, integration, and engineering for science applications and distributed research projects. Learning and workforce development (LWD) in

cyberinfrastructure is explicitly addressed in the program. Science-driven requirements are the primary motivation for any proposed activity.
Awards: Standard grants. Anticipated Funding Amount: $14,000,000 to $20,000,000
The estimated number of awards per program area is as follows: 5--10 Data-Driven Networking Infrastructure awards; 5-7 Regional Connectivity for Small Institutions awards; 5-8 Network Integration and Applied Innovation awards; 8-15 Campus Computing and the Computing Continuum awards; 3-5 Cyber Team—Research and Education CI-based Regional Facilitation awards; and 3-8 Planning Grants and CI-Research Alignment awards.
Letter of Intent: Not Required
Proposal Submission Deadline: January 21, 2020
Contacts: Kevin L. Thompson, Program Director, CISE/OAC, telephone: (703) 292-4220, email: kthompso@nsf.gov
Deepankar (Deep) Medhi, Program Director, CISE/CNS, telephone: (703) 292-8950, email: dmedhi@nsf.gov

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Grant Program: Macrosystems Biology and NEON-Enabled Science (MSB-NES)
Agency: National Science Foundation NSF 20-506
RFP Website:
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503425&org=NSF&sel_org=NSF&from=fund
Brief Description: The *Macrosystems Biology and NEON-Enabled Science (MSB-NES): Research on Biological Systems at Regional to Continental Scales* program will support quantitative, interdisciplinary, systems-oriented research on biosphere processes and their complex interactions with climate, land use, and changes in species distribution at regional to continental scales as well as training activities to broaden participation of researchers in Macrosystems Biology and NEON-Enabled Science.
Proposers are encouraged to use NEON resources, and proposals for substantive and innovative NEON-enabled research will be prioritized for funding.Substantive NEON-enabled projects rely on data and/or samples collected by NEON, co-locate research activities at NEON sites, and/or develop tools that will explicitly enhance the processing, use, and/or analysis of NEON data or collections within the context of Macrosystems Biology research questions.
Awards: Standard grants.
Letter of Intent: Not Required
Proposal Submission Deadline: January 16, 2020
Contacts: Daniel S. Gruner dgruner@nsf.gov (703) 292-7946
Matthew D. Kane mkane@nsf.gov (703) 292-7186

Grant Program: Transitions to Excellence in Molecular and Cellular Biosciences Research (Transitions)
Agency: National Science Foundation NSF 20-505
RFP Website: https://www.nsf.gov/pubs/2020/nsf20505/nsf20505.htm
Brief Description: The Division of Molecular and Cellular Biosciences (MCB) has developed a new opportunity to enable researchers with a strong track record of prior accomplishment to pursue a new avenue of research or inquiry. This funding mechanism is designed to facilitate and promote a PI's ability to effective adopt empowering technologies that might not be readily accessible in the PI's current research environment or collaboration network. Transformative research likely spans disciplines and minimizing the practical barriers to doing so will strengthen research programs poised to make significant contributions. The award is intended to allow mid-career or later-stage researchers (Associate or Full

Professor, or equivalent) to expand or make a transition in their research programs via a sabbatical leave or similar mechanism of professional development and then develop that research program in their own lab. This award will also enable the PI to acquire new scientific or technical expertise, facilitate the investigator's competitiveness, and potentially lead to transformational impacts in molecular and cellular bioscience. The award would fund up to six months of PI salary during the first sabbatical or professional development year, followed by support for continued research for two subsequent years upon the PI's return to normal academic duties. Through this solicitation MCB and NSF hope to develop a novel mechanism that will encourage investigators to expand and/or transition to new research areas aligned with MCB priorities, to increase retention of investigators in science, and to ensure a diverse scientific workforce that remains engaged in active research.

Highest funding priority is given to proposals that have outstanding intellectual merit and broader impacts, while proposals with weaknesses in either category (or those that are perceived as likely to have an incremental impact) will not be competitive. Proposals should also demonstrate a strong record of prior accomplishment, a compelling plan for professional development that will enable the PI to forge a new direction in their scholarship, and a strong rationale for why this support is needed for the PI to become competitive in the new research area. Support for the proposed transition from the PI's department, described in a letter from the department chair or equivalent, will also be required. Proposals that do not describe a plan for a transition in research direction will be considered unresponsive. Proposals that are motivated to understand the molecular and cellular basis of disease and disease treatments are not appropriate for the Division and will be returned without review.

Proposals addressing major open questions at the intersections of biology with other disciplines, such as physics, chemistry, mathematics, computer sciences, and engineering are of particular interest to the program.

Awards: Standard grants; 5-8 Awards
Anticipated Funding Amount: $6,000,000
Letter of Intent: Not Required
Proposal Submission Deadline: Proposals Accepted Anytime
Contacts: Michael Weinreich, telephone: (703) 292-7582, email: mcb-transitions@nsf.gov
Richard J. Cyr, telephone: (703) 292-8440, email: mcb-transitions@nsf.gov
Marcia E. Newcomer, telephone: (703) 292-4778, email: mcb-transitions@nsf.g

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Grant Program: National Artificial Intelligence (AI) Research Institutes: Accelerating Research, Transforming Society, and Growing the American Workforce
Agency: National Science Foundation NSF 20-503
RFP Website: https://www.nsf.gov/pubs/2020/nsf20503/nsf20503.htm
Brief Description: Artificial Intelligence (AI) has advanced tremendously and today promises personalized healthcare; enhanced national security; improved transportation; and more effective education, to name just a few benefits. Increased computing power, the availability of large datasets and streaming data, and algorithmic advances in machine learning (ML) have made it possible for AI development to create new sectors of the economy and revitalize industries. Continued advancement, enabled by sustained federal investment and channeled toward issues of national importance, holds the potential for further economic impact and quality-of-life improvements.
The 2019 update to the National Artificial Intelligence Research and Development Strategic Plan, informed by visioning activities in the scientific community as well as interaction with the public, identifies as its first strategic objective the need to make long-term investments in AI research in areas with the potential for long-term payoffs in AI.

This program, a joint effort of the National Science Foundation (NSF), U.S. Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA), U.S. Department of Homeland Security (DHS) Science & Technology Directorate (S&T), U.S. Department of Transportation (DOT) Federal Highway Administration (FHWA), and U.S. Department of Veterans Affairs (VA), seeks to enable such research through AI Research Institutes. This program solicitation describes two tracks: Planning and Institute tracks. Submissions to the Planning track are encouraged in any areas of foundational and use-inspired research appropriate to NSF and its partner organizations. Proposals for the Institute track must have a principal focus in one or more of the following themes, detailed in the Program Description under "Institute Track":

- Trustworthy AI;
- Foundations of Machine Learning;
- AI-Driven Innovation in Agriculture and the Food System;
- AI-Augmented Learning;
- AI for Accelerating Molecular Synthesis and Manufacturing; and
- AI for Discovery in Physics.

Awards: Standard grants; NSF plans to make 1-6 Institute Awards and approximately 8 Planning Grants.
Anticipated Funding Amount: $24,000,000 to $124,000,000
Letter of Intent: Not Required
Proposal Submission Deadline: January 28, 2020 for Institute proposals in one of the six specified themes; January 30, 2020 for Planning proposals
Contacts: AI Institutes Program Team, phone: (703) 292-8074, email: AIInstitutesProgram@nsf.gov

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Grant Program: Division of Environmental Biology (DEB)
Agency: National Science Foundation NSF 20-502
RFP Website:
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503634&org=NSF&sel_org=NSF&from=fund
Brief Description: The Division of Environmental Biology (DEB) Core Track supports research and training on evolutionary and ecological processes acting at the level of populations, species, communities, and ecosystems. DEB encourages research that elucidates fundamental principles that identify and explain the unity and diversity of life and its interactions with the environment over space and time. Research may incorporate field, laboratory, or collection-based approaches; observational or manipulative studies; synthesis activities; phylogenetic discovery projects; or theoretical approaches involving analytical, statistical, or computational modeling. Proposals should be submitted to the core clusters (Ecosystem Sciences, Evolutionary Processes, Population and Community Ecology, and Systematics and Biodiversity Sciences). DEB also encourages interdisciplinary proposals that cross conceptual boundaries and integrate over levels of biological organization or across multiple spatial and temporal scales. Research addressing ecology and ecosystem science in the marine biome should be directed to the Biological Oceanography Program in the Division of Ocean Sciences; research addressing evolution and systematics in the marine biome should be directed to the Evolutionary Processes or Systematics and Biodiversity Science programs in DEB.

All DEB programs also encourage proposals that leverage NSF-supported data networks, databases, centers, and other forms of scientific infrastructure, including but not limited to the National Ecological Observatory Network (NEON), Environmental Data Initiative (EDI), and Integrated Digitized Biocollections (iDigBio).
Awards: Standard grants
Letter of Intent: Not Required
Proposal Submission Deadline: Full Proposal Accepted Anytime

Contacts: Division of Environmental Biology debquestions@nsf.gov (703) 292-8480

National Institutes of Health

Grant Program: NCI Small Grants Program for Cancer Research for Years 2020, 2021, and 2022 (NCI Omnibus R03 Clinical Trial Optional)
Agency: National Institutes of Health PAR-20-052
RFP Website: https://grants.nih.gov/grants/guide/pa-files/PAR-20-052.html
Brief Description: The NIH R03 small grant mechanism supports discrete, well-defined projects that realistically can be completed in 2 years and that require limited levels of funding. Examples of the types of projects that the R03 grant mechanism include, but are not limited to, the following:

- Pilot or feasibility studies;
- Secondary analysis of existing data;
- Small, self-contained research projects;
- Development of research methodology; and
- Development of new research technology.

Specific Research Objectives
All areas of cancer research relevant to the mission of the NCI are appropriate for projects submitted in response to this FOA [for a list of extramural research funding programs at the NCI, go to http://www.cancer.gov/researchandfunding/extramural].
Projects submitted to this FOA may involve basic, translational, clinical, and/or population research related to cancer. *Examples of relevant areas include but are not limited to studies of:*
1. Cancer biology;
2. Cancer control;
3. Cancer diagnosis;
4. Cancer disparities;
5. Cancer prevention; and
6. Cancer treatment.

Award: A budget for direct costs of up to $50,000 per year may be requested.
Letter of Intent: Not Applicable
Deadline: February 24, 2020; June 24, 2020; October 20, 2020; February 24, 2021; June 24, 2021; October 20, 2021; February 24, 2022; June 24, 2022; October 20, 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: NIDCR Research Grants for Analyses of Existing Genomics Data (R01 Clinical Trial Not Allowed)
Agency: National Institutes of Health PAR-20-045
RFP Website: https://grants.nih.gov/grants/guide/pa-files/PAR-20-045.html
Brief Description: This FOA announces support for meritorious research projects that address DOC relevant biomedical questions by performing statistical and computational analyses of existing genomics data that are publicly shared, phenotypes, and other associated data. Applicants are required to address biological sex as a scientific variable by means of analytic approaches. Among research aims, applicants are required to propose experimental or *in silico* work to validate data analysis results or validate a newly

developed analytic method. Work that tackles causal mechanisms of action for onset and progression of disease for identified candidate causal genetic variants is highly encouraged.
Existing genomics data types that can be analyzed for DOC relevant projects include, e.g., genome-wide single nucleotide variants, whole exome sequences, whole genome sequences, transcriptomic data, epigenomic data, epitranscriptomic data, single cell genomic and expression data, and metagenomic data. Image data, including datasets available at FaceBase, are among phenotypic data types that can be analyzed in association with genomics data. Other data types that can be analyzed along with genomic data include clinical and environmental exposure data. Applicants can integrate and analyze data from multiple studies for a proposed project. Data generated from human study participants, animal models, or *in vitro* can all be used for understanding human DOC conditions or traits. Data analysis of each project can be performed using exiting and/or novel methods to be developed in the same project, including machine learning (ML)-based methods.
Projects that are inappropriate for this FOA include:

- Projects lacking genomics data analysis
- Projects using genomics data appropriately consented for public sharing but will not be shared publicly. These include projects that analyze only data not shared publicly or data shared publicly as well as data not shared publicly.

Award: Application budgets are not limited but need to reflect the actual needs of the proposed project.
Letter of Intent: Not Applicable
Deadline: Standard AIDS dates apply.
The first AIDS application due date for this FOA is May 7, 2020
All applications are due by 5:00 PM local time of applicant organization. All types of AIDS and AIDS-related 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: NCMRR Early Career Research Award (R03 Clinical Trial Optional)
Agency: National Institutes of Health PAR-20-042
RFP Website: https://grants.nih.gov/grants/guide/pa-files/PAR-20-042.html
Brief Description: The NCMRR Early Career Research (ECR) Award is different from other NIH R03 programs, including the Parent Announcement. It is restricted to clinical and basic scientists who are in the early stages of their independent career in rehabilitation research. The research must be focused on one or more of the areas within the biomedical and behavioral mission of NCMRR: pathophysiology and management of chronically injured nervous and musculoskeletal systems (including stroke, traumatic brain injury, spinal cord injury, and orthopedic conditions); repair and recovery of motor and cognitive function; functional plasticity, adaptation, and windows of opportunity for rehabilitative interventions; rehabilitative strategies involving pharmaceutical, stimulation, and neuroengineering approaches, exercise, motor training, and behavioral modifications; pediatric rehabilitation; secondary conditions associated with chronic disabilities; improved diagnosis, assessment, and outcome measures; and development of orthotics, prosthetics, and other assistive technologies and devices. The expected outcome from projects funded under this mechanism is the acquisition of necessary preliminary data for a subsequent research project grant (R01) application.
Award: The combined budget for direct costs for the entire project period may not exceed $200,000. No more than $100,000 in direct costs may be requested in any single year.
Letter of Intent: Not Applicable
Deadline: March 30, 2020, March 30, 2021, March 30, 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: NINDS Ruth L. Kirschstein National Research Service Award (NRSA) for Training of Postdoctoral Fellows (F32 Clinical Trial Not Allowed)
Agency: National Institutes of Health PAR-20-021
RFP Website: https://grants.nih.gov/grants/guide/pa-files/PAR-20-021.html
Brief Description: This NINDS F32 is designed specifically to support postdoctorates who are just beginning a postdoctoral training period in a given laboratory or research environment (support from this F32 FOA may be requested for either a first or subsequent postdoctoral mentored training position, but a subsequent postdoctoral position will only be supported if the laboratory, research environment and mentor(s) are completely different from those of the applicant's first postdoctoral position). The window during which applicants are eligible to apply (from approximately 12 months prior to starting in the proposed postdoctoral position to within 12 months of starting the postdoctoral position) precludes the expectation of applicant-generated preliminary data, and thus encourages projects that rely on creative, innovative ideas that address highly significant questions. Due to the early application window, it is expected that there will be no preliminary data in the application and applicants are strongly encouraged NOT to include preliminary data in the application. Further, this F32 will only support postdoctorates who are within the first 3 years of training in a specific laboratory or scientific environment (or with a specific mentor). Candidates seeking support that focuses on advanced postdoctoral career development can apply for the NINDS postdoctoral K01, and candidates seeking support for completion of postdoctoral career development and transition to a faculty position can apply for a K99/R00.
Award: Award budgets are composed of stipends, tuition and fees, and institutional allowance.
Kirschstein-NRSA awards provide stipends as a subsistence allowance to help defray living expenses during the research and clinical training experiences. See https://researchtraining.nih.gov/resources/policy-notices
Fellowship awards will contribute to the combined cost of tuition and fees at the rate in place at the time of award. See https://researchtraining.nih.gov/resources/policy-notices
Letter of Intent: Not required
Deadline: February 11, 2020, June 9, 2020, and October 14, 2020, February 11, 2021, June 9, 2021, October 14, 2021, February 9, 2022, June 8, 2022, and October 11, 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: 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/PAR-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.

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

Grant Program: Air Superiority Technology Broad Agency Announcement
Agency: Department of Defense FA8651-20-S-0008
Website:
https://www.fbo.gov/index?s=opportunity&mode=form&id=dbdb4a35cb22a4a0d8414b652f0c74bb&tab=core&_cview=0
Brief Description: For purposes of this announcement, research is defined to be scientific study and experimentation directed at increasing knowledge and understanding in relation to long term national security needs. It is an enhancement to related exploratory and advanced development programs. A program should be designed to demonstrate well-defined and substantive research results, should not be overly ambitious or open-ended, and should not be a paper study that inherently requires a substantial testing effort.
RESEARCH AREA 1 – MODELING, SIMULATION, & ANALYSIS (MS&A): The objective of this work is to develop/modify and employ models used to analyze Air Superiority concepts and their related concepts of employment. The objective is to apply, modify and/or combine engineering, engagement (one-on-one), mission (few-on-few), systems-of-systems, campaign (many-on-many, military worth), level modeling techniques, tools, and analysis methods as well as virtual and constructive digital simulation which lend themselves to the quick and effective evaluation of air superiority concepts. Concepts include, but are not limited to, intercommunicative weapons, novel damage mechanisms, lethal and novel destruct mechanisms, multiple targeting, and time critical delivery. Detailed modeling includes, but is not limited to, sensors, aerodynamics, autopilots, navigation and guidance schemes, propulsion, warheads, fuzes, datalinks, fire control, launcher, suspension, carriage and release, error filters, environment (wind, fog, and dust), lethality, vulnerability, and threats.
RESEARCH AREA 2 – INNOVATIVE AIRCRAFT INTEGRATION TECHNOLOGIES The objective of this work is to design, develop, and demonstrate innovative aircraft integration technologies including but not limited to physical, electrical, and logical interfaces; and other aspects of aircraft integration that may be applicable.
RESEARCH AREA 3 –FIND-FIX-TARGET-TRACK (F2T2) & DATALINK TECHNOLOGIES The objective of this work is to design, develop, and demonstrate innovative Find, Fix, Target, and Track (F2T2) technologies for the detection of threats to aircraft. These F2T2 technologies should provide threat warning, threat characteristics, You Are The One (YATO) or You Are Not The One (YANTO) discrimination, highly accurate threat cueing, range and range rate, and other pertinent information required to analyze and coordinate a response to a threat.
RESEARCH AREA 4 – ENGAGEMENT MANAGEMENT SYSTEM TECHNOLOGIES The objective of this work is to design, develop, and demonstrate an innovative Engagement Management system to

maximize aircraft survivability in increasingly contested environments while mining false positives and engagement costs. These technologies should interface with aircraft and other Find-Fix-Target-Track (F2T2) systems, determine the optimum counter measure response(s), respect keep-out or no-fire zones, and make other decisions required for aircraft survivability.
RESEARCH AREA 5 – HIGH VELOCITY FUZING The objective of this work is to design, develop, and demonstrate high velocity fuzing, including both Electronic Safe and Arm (ESAF) technologies that can safely initiate a warhead and Target Detection Devices (TDDs) that can provide miniaturized, fast-responding, highly accurate range and location information for high closure velocity intercepts.
RESEARCH AREA 6 – MISSILE ELECTRONICS The objective of this work is to investigate all aspects of Missile Power & Electronics as it applies to air-toair missiles. The following technologies and research areas are of particular interest: Power Conversion and Distribution, Power Generation and Storage Technologies (Advanced Missile Battery Technology and Ultracapacitors), Guidance Electronics, and Thermal Management.
RESEARCH AREA 7 – MISSILE GUIDANCE AND CONTROL TECHNOLOGIES The objective of this work is to investigate Missile Guidance and Control Technologies to include the following: Robust guidance algorithms against maneuvering targets, real time optimal lofting/energy management techniques, integrated guidance and control, reduced latency between seeker measurements and final control fin commands, highly accurate seeker technologies and algorithms, robust and novel target state estimators, third party queuing, optimal body orientation at endgame encounter, (reinforcement learning-adaptive control) approach, simultaneous learning and control, Hybrid (switched) guidance law selection based on the red-target strategy/maneuver, many-on-many engagement guidance laws, optimal pulse delay and propellant allocation, rapid flexible autopilot design process, robust control in aerodynamic cross coupling environments for various airframe designs from canard to tail control, robust control at high angles of attack, innovative autopilot architectures, efficient verification of safe separation over all flight regimes, Non-linear/adaptive control for agile maneuver, and advanced airframe control techniques.
RESEARCH AREA 8 – ADVANCED WARHEAD TECHNOLOGIES
More areas; Please see the BAA on above website.
Awards: Various
Proposal Deadline: This BAA will remain open through 31 October 2024 or until amended or superseded. It may be reissued and/or amended periodically, as needed. This BAA is set up in two parts: (1) Basic Open BAA, in which white papers may be submitted at any time during the open period, and (2) CALL BAA, in which proposal CALL announcements may be issued by the Government in FedBizOpps or Grants.gov under FA8651-20-S-0008. This BAA is intended to cover Applied Research, Advanced Technology Development and Advanced Component Development & Prototypes.
Contact Information: Technical POC: Mr. David Hartline , AFRL, (850) 882-1324
david.hartline.1@us.af.mil

Grant Program: 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: DSO Office-wide Broad Agency Announcement

Agency: Department of Defense DARPA HR001119S0071

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

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

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

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

Contact Information: BAA Email: HR001119S0071@darpa.mil

Department of Transportation

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

Agency: Department of Transportation 693JJ318NF5229-2019

Website:

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

Brief Description: The Dwight David Eisenhower Transportation Fellowship Program (DDETFP) awards fellowships to students pursuing degrees in transportation-related disciplines (PDF or HTML). This program advances the transportation workforce by helping to attract the nation's brightest minds to

the field of transportation, encouraging future transportation professionals to seek advanced degrees, and helping to retain top talent in the U.S. transportation industry. This funding opportunity is open to students that are U.S. citizens and non-U.S. citizens. The students must be enrolled in an IHE which must be accredited by a federally-recognized accrediting agency and must be located within the United States or its territories, both administratively as well as the campus the student is attending.
Awards: The anticipated stipends for the DDETFP GRF are based on academic level and shall be calculated as follows: Monthly Stipend: Master's Level: Up to $1,700; Doctoral Level: Up to $2,000
Proposal Deadline: July 25, 2019 at 3:00pm Eastern Time.
Contact Information: Ewa Flom Program Manager Phone 703-235-0532 ewa.flom@dot.gov

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Department of Agriculture:

Grant Program: REAP-Renewable Energy Systems and Energy Efficiency Improvements
Agency: Department of Agriculture RDBCP-11-REAP-RES-EEI-2020
Website: https://www.govinfo.gov/content/pkg/FR-2019-08-30/pdf/2019-18825.pdf
Brief Description: Eligible applicants are agricultural producers and rural small businesses. All agricultural producers, including farmers and ranchers, who gain 50% or more of their gross income from the agricultural operations are eligible. Small businesses that are located in a rural area can also apply. Rural electric cooperatives may also be eligible to apply. Additional Information on Eligibility:Citizenship - To be eligible, applicants must be individuals or entities at least 51 percent owned by persons who are either: 1) citizens of the United States (U.S.),the Republic of Palau, the Federated States of Micronesia, the Republic of the Marshall Islands, or American Samoa; or 2) legally admitted permanent residents residing in the U.S.Project - The project must be to conduct a feasibility study for a renewable energy system. Eligible technologies include: projects that produce energy from wind, solar, biomass, geothermal, hydro power and hydrogen-based sources. All projects must be located in a rural area and must be owned by the applicant.
Awards: Up to $500,000; Anticipated Funding: $70 million
Submission Deadline: September 30, 2020
Contact: Technical Contact: Maureen Hessel, Energy Specialist, Phone 202-401-0142

Department of Labor

Grant Program: Apprenticeships: Closing the Skills Gap
Agency: Department of Labor FOA-ETA-19-09
Website: https://www.grants.gov/web/grants/search-grants.html
Brief Description: Building on the experience abroad and in the United States, apprenticeships have emerged as a proven skills instruction model to meet industry's demand for a skilled American workforce. As the 21st economy requires greater skills development with an estimated 65 percent jobs of all jobs requiring some post-secondary education by 2020,1 apprenticeship programs can bolster the employability and technical skills of workers while meeting the workforce needs of business and industry.

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

The purpose of this grant program is to promote apprenticeships as a significant workforce solution in filling current job vacancies and closing the skills gap between employer workforce needs and the skills of the current workforce. The overarching goals of this grant program are threefold: (1) to accelerate the expansion of apprenticeships to industry sectors and occupations that have not traditionally deployed apprenticeships for building a skilled workforce, such as cybersecurity, artificial intelligence, and health care; (2) to promote the large-scale expansion of apprenticeships across the nation to a range of employers, including small and medium-sized employers; and (3) to increase apprenticeship opportunities for all Americans. Recognizing that apprenticeship is a training strategy that operates on both the supply side and the demand side of the labor market, this grant program aims to increase both the number of apprenticeship positions and the ability of all Americans to gain access to this proven pathway to family-sustaining careers.
Awards: We will award up to $100 million in H-1B funds initially to fund approximately 16 to 30 apprenticeship grants, with awards ranging from $500,000 to $6 million.
Anticipated Funding: $100,000,000
Proposal Deadline: September 24, 2019 no later than 4:00:00 p.m. Eastern Time.
Contact Information: Denise Roach Grants Management Specialist roach.denise@dol.gov

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EPA

Grant Program: Solid Waste Recycling Enhancement Act (REA) Higher Education Research Grant Program
Agency: NJ Department of Environmental Protection
Website: https://www.nj.gov/dep/grantandloanprograms/swrea-higher-ed.htm
Brief Description: This funding opportunity seeks to fund projects that support the objectives of the Recycling Enhancement Act. Eligible projects cover one or more of recycling demonstration, research or education, including professional training areas. Proposals may be designed to enhance existing resources, tools, or methodologies or create new resources pursuant to the Recycling Enhancement Act.
Awards: Approximately $1,000,000 of REA recycling tax funds have been allocated for this funding opportunity. Awardees and grant amounts will be selected based on the proposal, selection criteria and funds available to the Department.
Submission Deadline: December 13, 2019
Contact: Technical Contact: Fredrik Khayati, NJ Department of Environmental Protection, Division of Solid and Hazardous Waste; Phone: 609-984-4250
fredrik.khayati@dep.nj.gov

Grant Program: People, Prosperity and the Planet (P3) Student Design Competition
Agency: Environmental Protection Agency
EPA-G2020-P3-Q1 – Air Quality
EPA-G2020-P3-Q2 – Safe and Sustainable Water Resources
EPA-G2020-P3-Q3 – Sustainable and Healthy Communities
EPA-G2020-P3-Q4 – Chemical Safety
Website: https://www.epa.gov/research-grants/17th-annual-p3-awards-national-student-design-competition-focusing-people-0
Brief Description: The U.S. Environmental Protection Agency (EPA) – as part of its People, Prosperity and the Planet (P3) Award Program – is seeking applications proposing to research, develop, design, and

demonstrate solutions to real world challenges. The P3 competition highlights the use of scientific principles in creating innovative technology-based projects that achieve the mutual goals of improved quality of life, economic prosperity and protection of the planet – people, prosperity, and the planet. The EPA offers the P3 competition to respond to the needs of people in the United States (U.S.)—including those in small, rural, tribal and/or disadvantaged communities. Please see the People, Prosperity and the Planet (P3) Student Design Competition website for more details about this program. Proposed projects must embody the P3 approach, which is that they have the intention and capability to simultaneously improve the quality of people's lives, provide economic benefits and protect the environment.
Awards: Anticipated Funding Amount: Approximately $800,000 total for all awards Potential Funding per Award: Up to $25,000 per Phase I grant including direct and indirect costs. Applications for Phase I grants requesting an award of more than $25,000 will not be considered. Applications for Phase I grants must be for one year. Applications with a duration of more than one year will not be considered. Upon the successful completion of Phase I, grant recipients will have the opportunity to apply for a P3 Phase II grant of up to $100,000 total with a two-year duration, including direct and indirect costs (see Background section for more information). Applications for Phase II grants requesting an award of more than $100,000 or with a duration of more than two years will not be considered.
Submission Deadline: November. 19, 2019: 11:59:59 pm Eastern Time
Contact: Technical Contact: Technical Contact: Rich Callan; phone: 202-564-419; Eligibility Contact: Ron Josephson; phone: 202-564-7823; Submissions Contact: Debra M. Jones; phone: 202-564-7839

Department of Energy

Grant Program: FY 2020 Continuation of Solicitation for the Office of Science Financial Assistance Program
Agency: Department of Energy DE-FOA-0002181
Website: https://science.osti.gov/ber/Funding-Opportunities
Brief Description: TheSC mission is to deliver scientific discoveries and major scientific tools totransform our understanding of nature and advance the energy, economic andnational security of the United States. SC is the Nation's largest Federal sponsorof basic research in the physical sciences and the lead Federal agencysupporting fundamental scientific research for our Nation's energy future. SC accomplishes its mission and advances national goalsby supporting:

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

Awards: Various; Available Funding: $250,000,000
Proposal Submission Deadline: A Pre-Application is optional/encouraged. September 30, 2020
Contact: SC.Grantsandcontracts@science.doe.gov

Grant Program: Environmental System Science
Agency: Department of Energy DE-FOA-0002184
Website: https://science.osti.gov/ber/Funding-Opportunities
Brief Description: The DOE SC program in Biological and Environmental Research (BER) hereby announces its interest in receiving applications for research in Environmental Systems Science (ESS), including Terrestrial Ecosystem Science (TES) and Subsurface Biogeochemical Research (SBR). The goal of the Environmental System Science (ESS) activity in BER is to advance a robust, predictive understanding of the set of interdependent physical, biogeochemical, ecological, hydrological, and geomorphological processes for use in Earth system, ecosystem and reactive transport models. Using an iterative approach to model-driven experimentation and observation, and interdisciplinary teams, ESS-supported scientists work to unravel the coupled physical, chemical and biological processes that control the structure and functioning of terrestrial ecosystems and integrated watersheds across critical spatial and temporal scales. This FOA will consider applications that focus on improving the understanding and representation of terrestrial and subsurface environments in ways that advance the sophistication and capabilities of local, regional, and larger scale models. Using new measurements, field experiments, more sophisticated modeling and/or synthesis studies, this FOA will encompass two topic areas: 1) Terrestrial Ecology, specifically linking above and belowground processes, as well as methane biogeochemistry; and 2) Subsurface and Watershed Hydro-biogeochemistry, specifically studying the function and dynamics of hydro-biogeochemical processes within watersheds. All applications are required to clearly delineate an integrative, hypothesis-driven approach and describe the existing needs/gaps in state-of-the-art models. Applicants should provide details on how the results of the proposed research will be used to improve the predictability and sophistication of integrated watershed systems and/or terrestrial ecosystem models.
Awards: Various
Proposal Submission Deadline: Submission Deadline for Pre-Applications: December 5, 2019, at 5:00 pm Eastern Time Pre-Application Response Date: December 19, 2019, at 11:59 pm Eastern Time Submission Deadline for Applications: February 20, 2020, at 11:59 pm Eastern Time.
Submit letters of intent, preapplications, and applications well ahead of stated deadlines.
Contact: Dr. Daniel Stover 301-903-0289 Daniel.Stover@science.doe.gov

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Grant Program: Generating Electricity Managed by Intelligent Nuclear Assets (GEMINA)
Agency: Department of Energy DE-FOA-0002174
Website: https://arpa-e-foa.energy.gov/#FoaId4f8d5ac3-267d-4849-ad63-80f858761a74
Brief Description: The aim of this ARPA-E program is to make a transformational change to the current state-of-the-art and improve advanced reactor (AR) designs with operations and maintenance (O&M) in mind. Advances in autonomous, efficient, and low-cost systems O&M are occurring in many industrial sectors, largely powered by artificial intelligence (AI), advanced data analytics, distributed computing, powerful physics simulation tools, and other technical breakthroughs. To date, little of this advancement has been adopted by the nuclear energy industry. There is a crucial need to design and execute extremely robust and low-cost operations and maintenance procedures for ARs.

To accomplish this goal, ARPA-E seeks interdisciplinary teams to develop digital twins (DTs), or a technology with similar capability, for an AR design as the foundation of the team's O&M strategy. The digital twins (or equivalent) and associated O&M approaches the teams will develop will include diverse technologies that are driving efficiencies in other industries, such as AI, advanced control systems, predictive maintenance, and model-based fault detection. Because ARs are still in design phases, with no physical units operating, teams working on core operations will also develop cyber-physical systems (CPS) that simulate advanced reactor plant operating dynamics using a combination of non-nuclear

experimental facilities (e.g., flow loops) and software. Teams will use these systems as the "real asset," a surrogate upon which developers can test their DT platforms for operations and maintenance. CPS may also provide validation data for regimes for conditions with high uncertainty. Teams focusing on activities outside the reactor core are encouraged to identify appropriate test systems and data. ARPA-E will also support research for filling specific technical gaps to enable the O&M strategies.
Awards: Various; Available Funding: $35,000,000
Proposal Submission Deadline: Concept Paper: 11/13/2019 9:30 AM ET; Applicants are strongly encouraged to submit their applications at least 48 hours in advance of the submission deadline
Contact: ARPA-E CO arpa-e-co@hq.doe.gov

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/#FoaIdcf23a62d-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:
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

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

NASA

Grant Program: ROSES 2019: Advancing Collaborative Connections for Earth System Science
Agency: NASA NNH19ZDA001N-ACCESS
Website: https://nspires.nasaprs.com/external/solicitations/summary.do?solId=%7B110CE76C-2B83-13FF-7E13-E0AB835DAA36%7D&path=&method=init
Brief Description: The primary goal of the Advancing Collaborative Connections for Earth System Science (ACCESS) Program is to adopt and implement technologies to effectively manage, discover and use NASA's archive of Earth observations for scientific research and applications. This program complements NASA's Earth Observing System Data and Information System (EOSDIS) by engaging researchers and software developers external to EOSDIS in NASA's mission to "drive advances in science, technology, aeronautics, space exploration, economic vitality, and stewardship of the Earth" and furthers the Earth Science Strategic objective from the NASA 2014 Science Plan to "advance knowledge of Earth as a system to meet the challenges of environmental change and to improve life on our planet" (http://science.nasa.gov/about-us/sciencestrategy/). ACCESS aims to improve and expand the use of NASA's Earth science data by leveraging modern techniques for discovering, managing and analyzing large and complex Earth science data sets.
Awards: Various; Expected total program budget for new awards: $5,000,000
Proposal Deadline: December 19, 2019 for NNH19ZDA001N-AS3
March 27, 2020 for NNH19ZDA001N
Contact: Kevin Murphy, Program Executive Telephone: (202) 358-3042
email: kevin.j.murphy@nasa.gov

Grant Program: Future Investigators in NASA Earth and Space Science and Technology
Agency: NASA NNH19ZDA001N-FINESST
Website: https://nspires.nasaprs.com/external/solicitations/summary.do?solId=%7BE16CD59F-29DD-06C0-8971-CE1A9C252FD4%7D&path=&method=init
Brief Description: The Future Investigators in NASA Earth and Space Science and Technology (FINESST) is a new program element in Research Opportunities in Space and Earth Sciences (ROSES)-2019. ROSES is an "omnibus" solicitation, having default guidelines and information in the ROSES Summary of Solicitation that apply to all of ROSES, including this program element. Through FINESST, the Science Mission Directorate (SMD) solicits proposals from accredited U.S. universities and other eligible organizations for graduate student-designed and performed research projects that contribute to SMD's science, technology and exploration goals. The Future Investigator (FI, i.e., the student participant)

shall have the primary initiative to define the proposed FINESST research project and must be the primary author, with input or supervision from the proposal's Principal Investigator (PI), as appropriate. In cases when the PI already has an ongoing research award from NASA, the research proposed under FINESST may address a similar topic, but the proposal should make clear how the proposed research goes beyond what NASA has already agreed to support.
Awards: The number of proposals selected will be dependent on the number and quality of proposals submitted and on the availability of funds from the relevant SMD program.
Proposal Deadline: Proposals may be submitted at any time until 11:59 pm Eastern time on February 4, 2020.
Contact: Emails FINESST Program Scientists by Division: Earth Science: allison.k.leidner@nasa.gov Planetary Science: lindsay.hays@nasa.gov Astrophysics: evan.scannapieco@nasa.gov Heliophysics: hakimzadeh@nasa.gov

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Grant Program: ROSES 2019: Heliophysics System Observatory Connect
Agency: NASA NNH19ZDA001N-HSOC
Website: https://nspires.nasaprs.com/external/solicitations/summary.do?solId=%7B1C50B1BF-52BA-7DD2-848D-13409588466F%7D&path=&method=init
Brief Description: The goal of the Heliophysics System Observatory (HSO) Connect program is to enhance the scientific return of the HSO by supporting investigations that innovatively connect observations from one or more HSO missions with spacecraft or ground-based observations from other SMD Divisions, and/or other agencies within or outside the U.S. This instance of HSO-Connect focuses on observations from the Parker Solar Probe (PSP) mission together with other observations throughout the whole heliosphere. This includes data from currently operating space missions and ground-based observatories, and can include data from missions or observatories not yet launched or operational, but expected to be operational within the time interval of awards from this competition. In addition to PSP observations, investigations can include, but are not limited to, any HSO mission, but also Solar Orbiter, Bepi-Colombo, the Daniel K. Inouye Solar Telescope (DKIST) for example. In order to include observations not yet available, NASA Heliophysics is relaxing the requirement that all data must be in a public archive ahead of proposal submission (see Section 3.4.3 Limited Risk Waver).
Awards: Various
Proposal Deadline: Step-1 proposals are due by January 15, 2020, and Step-2 proposals are due March 13, 2020.
Contact: Arik Posner, Heliophysics Division, Science Mission Directorate, Telephone: (202) 358 0727
Email: arik.posner@nasa.gov

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: 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 Chiaramonte, Program Scientist for Physical Sciences Contact email

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Grant Program: ROSES 2019: Living With a Star Science
Agency: NASA NNH19ZDA001N-LWS
Website: https://nspires.nasaprs.com/external/solicitations/summary.do?solId=%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

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Grant Program: ROSES 2019: B.7 Space Weather Science Applications Operations 2 Research
Agency: NASA NNH19ZDA001N-SWO2R
Website: https://nspires.nasaprs.com/external/solicitations/summary.do?solId={BD18A167-6DE8-1A35-A0ED-96F16AC6DE49}&path=&method=init
Brief Description: In October 2015, the National Science and Technology Council (NSTC) in the Executive Office of the President released the National Space Weather Strategy and the National Space Weather Action Plan (SWAP). In March 2019, these were updated with the release of the National Space Weather Strategy and Action Plan (NSW-SAP). The objectives of the actions described in the SWAP and NSW-SAP are to improve the understanding of, forecasting of, and preparedness for space weather events, recognizing the need for close cooperation among the federal agencies. The SWAP and NSW-SAP call for NASA, National Science Foundation (NSF), and Department of Defense (DOD) to identify and support basic research on space weather. They also direct NASA, Department of Commerce (DOC), and DOD to identify and support research opportunities that address targeted operational space-weather needs. Furthermore, they direct NASA, NSF, DOC, and DOD to facilitate the transition of space weather information and prediction capabilities to the Nation's space weather service providers (research-to-operations and operations-to-research). In response to the need to advance and coordinate the Nation's space weather research and operations capabilities, NASA has established the Heliophysics Space Weather Science Applications program, of which this operations-to-research (O2R) call is a part. NASA is supporting this funding opportunity in coordination with DOC/National Oceanic and Atmospheric Administration (NOAA) to promote O2R activities. For this call, the objective of O2R efforts is broadly defined as the joint pursuit of improvements of operational capabilities and advancements in related fundamental research.

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

Proposal Deadline: Step-1 Proposal: December 16, 2019
Contact: James Spann Heliophysics Division Science mission Directorate NASA Headquarters Washington, DC 20546-0001 Telephone: 202-358-0574 Email: jim.spann@nasa.gov

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National Endowment of Humanities

Grant Program: Digital Humanities Advancement Grants
Agency: National Endowment for the Humanities 20200115-HAA
Website: https://www.neh.gov/grants/odh/digital-humanities-advancement-grants
Brief Description: Digital Humanities Advancement Grants (DHAG) support innovative, experimental, and/or computationally challenging projects at different stages throughout their lifecycles, from early start-up phases through implementation and sustainability. Experimentation, reuse, and extensibility are hallmarks of this program, leading to innovative work that can scale to enhance scholarly research, teaching, and public programming in the humanities. This program is offered twice per year. Proposals are welcome for digital initiatives in any area of the humanities.

In support of its efforts to advance digital infrastructures and initiatives in libraries and archives, and subject to the availability of funds and IMLS discretion, the Institute of Museum and Library Services (IMLS) anticipates providing funding through this program. These funds may support some DHAG projects that further the IMLS mission to advance, support, and empower America's museums, libraries, and related organizations. IMLS funding will encourage innovative collaborations between library and archives professionals, humanities professionals, and relevant public communities that advance preservation of, access to, and public engagement with digital collections and services to empower community learning, foster civic cohesion, and strengthen knowledge networks. This could include collaborations with community-based archives, community-driven efforts, and institutions or initiatives representing the traditionally underserved. Interested applicants should also refer to the current IMLS Strategic Plan for additional context.
Awards: Maximum award amount Level I: $50,000
Level II: $100,000
Level III: $325,000 in outright funds, with an additional $50,000 in matching funds
Deadlines: Optional Draft due December 4, 2019
Application due January 15, 2020
Contact: Contact the Division of Research Programs Team: 202-606-8200
collaborative@neh.gov

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.

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

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Brain Research Foundation (BRF)

Grant Program: Brain Research Foundation: 2020 Seed Grant Program
Agency: Brain Research Foundation (BRF)
Website: https://www.thebrf.org/
Brief Description: BRFs Annual Seed Grant Program was initiated in 1981. The purpose of the Program is to provide start-up money for new research projects and innovative programs that have the potential of becoming competitive for an NIH grant or other external funding sources. Our goal is to have this initial effort succeed in opening future opportunities for research, collaboration and scientific advancement.
Awards: Each total award is limited to $80,000 (direct costs) for a two year grant period. The first grant payment of $40,000 will be made upon completion of the Seed Grant Acceptance Form (June 2020). The final payment of $40,000 will be made contingent upon receipt of a Preliminary Progress and Financial Report (June 2021). The support focus is for new research projects of the highest scientific merit.
Proposal Deadline: Brain Research Foundation (BRF) has invited **eligible US academic institutions to nominate one (1) faculty member** to submit a Letter of Intent (LOI) for the BRF Grant Program. Nominated candidates must submit an LOI, with a biosketch, by **January 7, 2020.**

Streamlyne Question of the Week

Question: I need to change my budget - Do I need to change it in Streamlyne?
Answer: You can change your budget at any point before submitting the proposal into workflow approval. For more information, please contact your college ambassador, or see New User Manual posted on the Research website http://www.njit.edu/research/sites/research/files/StreamlyneNewUserManualCommonElements.pdf).
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/.

Steamlyne_NewUserManual_CommonElements.docx : This manual provides a reference to all the common elements of Streamlyne Research. This user manual is a good document to review each module's functionality.
Steamlyne_NewUserManual_PD&PDBudget.docx: This is a user manual on proposal and budget development in Streamlyne. The content herein explain the use and functionality of this module. This is the most useful Streamlyne document for PIs and users new to Streamlyne.

Faculty and staff having any questions on proposal submission, may contact their college representatives, and also follow up with **Justin Samolewicz, Director (Pre Award)** 973-596-3145; justin.m.samolewicz@njit.edu; and **Eric Hetherington,** Executive Director, Sponsored

Research Programs Administration 973-596-3631; eric.d.hetherington@njit.edu. The college representatives to help PIs on proposal submissions are

NCE: John McCarthy, NCE Director of Research; (973) 596-3247; john.p.mccarthy@njit.edu
NCE: Deidra Slough, Grant Management Specialist, (973)-596-3428; deidra.l.slough@njit.edu

CSLA: Cristo Leon, CSLA Director of Research; (973) 596-6426; cristo.e.yanezleon@njit.edu
CSTR: Felicia Margolies, Project Manager, (973)-596-5377 felicia.h.margolies@njit.edu

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

HCoAD and MTSM: Interim POC: Justin Samolewicz, Director (Pre Award); (973)-596-3145; justin.m.samolewicz@njit.edu**; Iris Pantoja**, Project Manager; 973-596-4483; irp3@njit.edu (on maternity leave)

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

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Need Information about Funding?

Finding Research Opportunities and Collaborations (FROC)
***Walk-In* Open-Hour Discussion with SVPR Over Tea**
Every Thursday: 2.00 PM-3.00 PM; 340 Fenster Hall

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

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

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

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

Enjoy coffee/tea and cookies with SVPR over the discussion.
For any questions and additional information, please send an email to SVPR at dhawan@njit.edu.
