

NJIT Research Newsletter

Issue: ORN-2019-45

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

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Special Announcements

Open Forum and Workshop on NJIT Research Challenges and Big Ideas

10.00 AM – 2.00 PM, December 4, 2019

Venue: Ballroom A and B, Campus Center

We will be hosting an Open Forum and Workshop on December 4 from 10.00 AM to 2.00 PM to discuss some of the grand challenges and big ideas with the input received from the NJIT community so far. A summary of the grand challenges and big ideas from funding agencies and organizations, and NJIT community input on selecting research challenges can be accessed through the link <https://drive.google.com/drive/folders/1yU0LgaApK5U5eHvcJ46wQXYdGj8Ygo6?usp=sharing>. The Keynote address at the workshop will highlight the United Nations Sustainable Development goals with major global challenges (<https://www.un.org/sustainabledevelopment/>). It will lead our discussion on NJIT's research priorities addressing specific global challenges and big ideas of high scientific and social impact.

During the Workshop, we will form faculty groups aligned with the 2025 Research Cluster areas that we developed earlier in the Draft 2025 NJIT Strategic Plan to start discussions. The interdisciplinary research cluster areas will be represented by faculty with the following co-chairs:

- Bioscience and Bioengineering: Co-Chairs: Bryan Pfister and Gareth Russell
- Data Science and Management: Co-Chairs: David Bader and Zhipeng Yan
- Environment and Sustainability: Co-Chairs: Jay Meegoda and Som Mitra
- Materials Science and Engineering: Co-Chairs: David Venerus and Tao Zhou
- Robotics and Machine Intelligence: Co-Chairs: Usman Roshan and Cong Wang

We kindly request faculty and researchers to join the Open Forum research cluster groups to discuss and develop a list of **three research challenges and big ideas** (in a priority order) per cluster for which the respective cluster will take the ownership and leadership with other clusters contributing as stakeholders for future strategic growth of NJIT research enterprise.

For developing trans-disciplinary research challenges and big ideas across the clusters for broader impact, each research challenge and big idea should have contributions of two or more research clusters. However, it is not necessary that all selected research challenges and big ideas should have contributions from all research clusters.

Our goal for the workshop is to have a rough draft of 15 research challenges and big ideas for further discussion with institutional stakeholders including faculty research committees, students, chairs and deans after the winter break. If you are unable to join the Workshop, please send your input for a specific research challenge and big idea to the respective research cluster area co-chair.

Objective of the Open Forum and Workshop

Develop a robust and actionable roadmap to align NJIT research expertise and enterprise with the select Global Challenges and Big Ideas. The roadmap will form the foundation for NJIT's strategic direction to drive partnerships and collaborative research and development for sustained societal impact.

Agenda

10.00 AM - 10.15 AM: Welcome Remarks

2025 NJIT Strategic Plan: Building on a Strong Foundation

Fadi Deek, Provost and Senior Executive Vice President

NJIT Framework of Open Forum and Workshop: Research Directions and and Big Ideas: Planning Objectives

Atam Dhawan, Senior Vice Provost for Research

10.15 AM - 11.00 AM: Keynote: United Nations Sustainable Development Goals

(<https://www.un.org/sustainabledevelopment/>)

Speaker: TBA

11.00 AM - 11.30 AM: Brief Presentations on NJIT Research Clusters and Synergies

11.30 AM - 12.00 PM: Lunch and Networking Session (Pick up lunch and join your cluster table)

12.00 PM – 1.00 PM: Brainstorming Planning Sessions: Research Cluster Group Sessions on NJIT Research Challenges and Big Ideas

Bioscience and Bioengineering: Co-Chairs: Bryan Pfister and Gareth Russell

Data Science and Management: Co-Chairs: David Bader and Zhipeng Yan

Environment and Sustainability: Co-Chairs: Jay Meegoda and Som Mitra

Materials Science and Engineering: Co-Chairs: David Venerus and Tao Zhou

Robotics and Machine Intelligence: Co-Chairs: Usman Roshan and Cong Wang

1.00 PM - 1.30 PM: Research Cluster Group Reports and Discussion: Future Directions

Presenters: Research Cluster Committee Co-Chairs

Moderator: Govi Rao, Co-Founder and Managing Partner,

CARBON Group Global (<https://www.carbongroup.global/>)

1.30 PM - 2.00 PM: Closing Remarks: Summary and Action Plan

Grant Opportunity Alerts

Keywords and Areas Included in the Grant Opportunity Alert Section Below

NSF: Next Generation Software for Data-driven Models of Space Weather with Quantified Uncertainties (SWQU); Semiconductor Synthetic Biology for Information Storage and Retrieval (SemiSynBio-II); Environmental Convergence Opportunities in Chemical, Bioengineering, Environmental, and Transport Systems (ECO-CBET); Improving Undergraduate STEM Education: Pathways into the Earth, Ocean, Polar and Atmospheric & Geospace Sciences (IUSE:GEOPATHs); Future of Work at the Human-Technology Frontier: Core Research (FW-HTF); 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)

NIH: Utilizing Invasive Recording and Stimulating Opportunities in Humans to Advance Neural Circuitry Understanding of Mental Health Disorders (R01 and R21), NIH Blueprint Program for Enhancing Neuroscience Diversity through Undergraduate Research Education Experiences (BP-ENDURE) (R25); NEI Center Core Grant for Vision Research (P30); 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)

Department of Defense/US Army/DARPA/ONR: C4ISR, Information Operations, Cyberspace Operations and Information Technology System Research, 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: Integrated Research, Education, and Extension Competitive Grants Program – Organic Transitions; REAP-Renewable Energy Systems and Energy Efficiency Improvements

Department of Labor: Apprenticeships: Closing the Skills Gap

EPA: Solid Waste Recycling Enhancement Act (REA) Higher Education Research Grant Program; People, Prosperity and the Planet (P3) Student Design Competition

Department of Energy: Flexible Carbon Capture & Storage (FLECCS); FY 2020 Solicitation for the Office of Science Financial Assistance Program; Environmental System Science

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

National Geographic: Biodiversity Exploration and Discovery

Brain Research Foundation: Brain Research Foundation (BRF) Seed Grant

Recent Research Grant and Contract Awards

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

PI: Xuan Liu (PI)

Department: Electrical and Computer Engineering

Grant/Contract Project Title: Compressive Optical Coherence Tomography

Funding Agency: Nokia

Duration: 05/01/18-02/28/21

In the News...

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

National Strategic Computing Initiative Update: Pioneering the Future of Computing: The national computing landscape is undergoing rapid evolution along multiple dimensions due to the introduction of new and potentially disruptive technologies and the demands of new classes of data intensive applications. Computer architectures and systems are more heterogeneous and complex, and the challenges associated with the complexity and sustainability of software are significant. Application developers are being called to meet demands for improved usability and productivity. Therefore, to address this new environment, it is essential to update the 2016 U.S. Strategic Computing Plan¹ in a holistic and synergistic fashion that involves government, academia, and industry. The Office of Science and Technology Policy and the National Science and Technology Council Subcommittee on Networking and Information Technology Research and Development created a Fast Track Action Committee on Strategic Computing in June 2019 to address this imperative.

The refocused objectives identified are:

1. Pioneer new frontiers of digital and non-digital computation to address the scientific and technological challenges and opportunities of the 21st century.
2. Develop, broaden, and advance the Nation's computational infrastructure and ecosystem.
3. Forge and expand partnerships for the future of computing to ensure American leadership in science, technology, and innovation.

What follows includes key goals for a strategic approach to the future of computing, and a set of recommendations to achieve those goals, which will expand our scientific knowledge, enable economic growth, and improve our national security. These recommendations and goals were determined via engagement with government, academia, and industry through various means, including a Request for Information (RFI)² and a Future Computing Community of Interest Meeting.

The full report is posted on the website <https://www.whitehouse.gov/wp-content/uploads/2019/11/National-Strategic-Computing-Initiative-Update-2019.pdf>

Energy Frontiers: The Department of Energy anticipates spending \$40 million in FY 2020 to support Energy Frontier Research Centers conducting fundamental research on: "quantum information science, microelectronics, environmental management and polymer upcycling (developing the chemistry to convert waste plastics into fuels and other high-value products)." The funding announcement is posted on the website https://science.osti.gov/-/media/grants/pdf/foas/2020/SC_FOA_0002204.pdf and also included in the Grant Opportunities section below.

Early Career Awards: DOE expects to make about 65 awards, beginning in FY 2020, totaling \$49 million. "Applicants should request project support for five years, with the release of out-year support contingent on adequate progress of the research." Awards are expected to begin in FY 2020. The funding announcement is posted on the website https://science.osti.gov/-/media/grants/pdf/foas/2020/SC_FOA_0002173.pdf and also included in the Grant Opportunities section below.

Hearing Update: Senate Subcommittee Holds Hearing on Securing U.S. Research from China's Talent Recruitment Plans: On November 19, the U.S. Senate Homeland Security and Governmental Affairs Committee's (HSGAC) Permanent Subcommittee on Investigations (PSI) held a hearing entitled, "Securing the U.S. Research Enterprise from China's Talent Recruitment Plans." The hearing included witnesses from the Federal Bureau of Investigation (FBI), National Science Foundation (NSF), National Institutes of Health (NIH), Department of Energy's (DOE) Office of Science, and the U.S. Department of State's Bureau of Consular Affairs (State). In conjunction with the hearing, a bipartisan PSI staff report, Threats to the U.S. Research Enterprise: China's Talent Recruitment Plans, was released. The committee also released two appendices with examples of talent recruitment contracts and case studies of recruitments.

The research agency witnesses all acknowledged the essential role that international collaboration and cooperation play in the scientific enterprise, as well as the importance of continuing our nation's openness to the world's best and brightest. They noted, however, the need for increased inter-agency coordination of grant policies and greater awareness of the security threat by research institutions.

John Brown, Assistant Director, Counterintelligence Division, Federal Bureau of Investigation (FBI)

- The FBI is seeking additional means to identify those targeting U.S. research discoveries.
- Each of the 56 FBI field offices has a taskforce, which works with a centralized counterintelligence national task force. Each field office has unique relationships with local institutions.
- The FBI is committed to working with the higher education research community to improve guidelines, and the Bureau has noted an improved willingness by institutions to address this issue.
- Engagement with the higher education research community is conducted through the FBI's Office of the Private Sector.
- The FBI was not at liberty to disclose in an open hearing how they are tracking talent programs given the secrecy around these programs now.

Rebecca Keiser, Office Head, Office of International Science and Engineering, National Science Foundation (NSF)

- NSF is committed to confronting the science and security threat, and noted compliance with disclosure requirements is extremely important.
- A joint NSF- JASON advisory report is expected by the end of the year.
- NSF supports efforts to harmonize disclosure forms and is in the process of adopting the NIH Biosketch process in addition to sharing its own resources on conflicts of interest.
- NSF already requires responsible conduct of research training and could add ethical and research integrity training as part of that requirement.
- NSF also recognizes the need to provide modules to help institutions and ensure compliance.
- Increased federal funding in research and development is needed to respond to China's increased investment in science and technology.

Michael Lauer, Deputy Director for Extramural Research, National Institutes of Health (NIH)

- As of October 2019, seventy institutions have been contacted with specific NIH concerns.

The current investigations caseload is in the hundreds, and NIH has currently identified 140 individuals of concern.

- NIH has seen significant violations of its Terms and Conditions as it relates to conflicts of interest and is training staff to report suspicious activity as it relates to the peer review process.
- Individuals who are guilty of infractions are a small percentage of those supported with NIH funds.
- NIH is developing resources to help investigators and is working with OSTP to better coordinate federal efforts.
- There is concern over the morale of foreign-born researchers and the need to continue U.S. collaborations with foreign countries.

Christopher Fall, Director, Office of Science, U.S. Department of Energy (DOE)

- The Administration is taking a “whole-of-government” approach to this issue.
- DOE is aware of instances where individuals at national labs have been offered hundreds of thousands and even millions of dollars to participate in talent programs.
- DOE will not allow national laboratory employees or contractors to participate in talent recruitment programs.
- DOE is looking at more than just foreign talent programs and is in the process of developing a technology matrix that identifies sensitive technologies, which will be used as a risk-assessment tool in determining access to these technologies.
- International collaboration and cooperation are essential to fundamental research.

Full report is posted on the website <https://drive.google.com/file/d/1a6LnJiDeTpKI8lmc-bEAtSD1jOgl1aOWq/view>

2019 White House Summit of the Joint Committee on the Research Environment (JCORE): In May 2019, The National Science and Technology Council (NSTC) established a Joint Committee of the Committee on Science and the Committee on Science and Technology (S&T) Enterprise to address issues related to research environment safety, integrity, and productivity. Specifically, the Joint Committee will examine:

- Administrative burdens on federally-funded research,
- Rigor and integrity in research,
- Safe, inclusive, and equitable research settings,
- Open research environments balanced with security.

These cross cutting issues align efforts across both NSTC Committees and bring together the leadership of the two Committees in elevating research environment challenges, engaging the scientific community, and convening interagency problem solving.

JCORE has a focus on four key areas. The first one is **research integrity**, which is fundamentally focused on people playing by the rules. It does not matter where you are from. If you sign up to do research, you do not plagiarize, you do not falsify, you do not fabricate, you do not fail to disclose, you do not fail to do what is required of you in the research community. And if you do, then you are fundamentally violating the central values of research. The values we live by are the ones I mentioned. Research integrity is extremely important, robust reproducibility is critical.

The next area of focus is **research security**. We must make sure that we appropriately balance the openness that is so important in making our research enterprise the world leader with the recognition that we face new challenges and threats today to our research enterprise. We have to find ways to maintain the degree of openness that is vital to research success while being vigilant and putting in place appropriate mechanisms to guard our intellectual property, our ideas, and proposals.

The third area of focus is **safe and inclusive research environments**. I mentioned this before. Safety includes laboratory safety, physical safety. It also includes diversity in the broadest sense and ensuring our research environments are free from harassment of any kind. Such harassment is inconsistent with the research values we hold dear. Again, values and integrity are fundamental to the entire research enterprise.

Lastly, **administrative workload** is the fourth area of focus that also crosscuts all the areas we already discussed. Research workload is a critical area. The Federal Demonstration Partnership has done surveys for the last twenty some years that show faculty at our universities spend about 42-44% of their time, on average, on administrative activities when they are funded by federal research grants and contracts. I do not know what the right number is, but 44% strikes me as quite large. One of the important concepts we are considering is balancing and proactively considering burden as we move forward with the other three work streams around integrity, security, and safe, inclusive research environments.

The [White House Office of Science and Technology Policy's summary says](#): "As a major objective, the research enterprise should work to maximize reporting of harassment and other inappropriate behaviors. This requires addressing fears of retaliation that often prevent individuals from coming forward. • Efforts to address harassment, research security threats, and research rigor and integrity should address the issue of confidentiality. Other points: "The Federal Government should partner with research institutions to build a transparent and bidirectional system for communication regarding security concerns. This system should facilitate access to educational resources (such as FBI threat briefs), and should seek to promote sound and risk-informed deliberations and decisions within institutions. • The Federal government should provide examples and case studies related to research security and inappropriate behaviors, as well as information regarding numbers of actual cases."

Full report is posted on the website <https://www.aau.edu/sites/default/files/AAU-Files/Key-Issues/Science-Security/Summary-of-JCORE-Summit-November-2019.pdf>

NIH Funding and Data Sharing Policy: A draft National Institutes of Health policy "will require all investigators with NIH funding to make their data sets available to colleagues. For the first time, grantees holding any NIH-funded grant—not just those above a \$500,000 threshold in direct costs—will need to submit a detailed plan for sharing data, including steps to protect the privacy of research subjects. NIH and its 27 institutes already have many data sharing policies, for example for genomic data and clinical trial results. Certain programs require data sharing, such as the Cancer Moonshot. And journals often have similar requirements. A report is posted on Science Insider website <https://www.sciencemag.org/news/2019/11/why-nih-beefing-its-data-sharing-rules-after-16-years>

Proposal for \$100 Billion for AI Research over 5 Years: That's what Senate Minority Leader Charles Schumer (D-N.Y.) is proposing to "keep pace with China and Russia in a critical research arena and plug gaps in what U.S. companies are unwilling to finance," [ScienceInsider reports](#). "Schumer wants to create a new national science tech fund that would pour \$100 billion [over five years] into 'fundamental research related to AI and some other cutting-edge areas.' His list includes quantum computing, 5G networks, robotics, cybersecurity, and biotechnology. The money would fuel research at U.S. universities, companies, and other federal agencies, he explained, as well as paying for 'testbed facilities.'"

Webinar and Events

Event: Shorten your development cycles with automated Design of Experiments

Sponsor: Synthace and TTP Labtech

When: December 3, 2019; 3.00 PM – 3.45 PM

Website: https://info.synthace.com/webinar-synthace-ttp-labtech-automated-doe?utm_campaign=Technology%20Networks%20Third%20Party&utm_source=hs_email&utm_medium=email&utm_content=79674476&hsenc=p2ANqtz--TTbFj67ZQp9vZ9Lvy-RPiJwUAmYlw27bVS4jsSIP3iwIA_h2UKJEATaZZL3DhdccLHElpuTZIhdnWX3NOkgt3md_oGw&hsmi=79674476

Brief Description: Synthace and TTP Labtech have joined forces to push the boundaries in automated execution of sophisticated Design of Experiment (DoE) campaigns to accelerate assay optimization.

- Learn how you can amplify your team's productivity with automated DoE
- See the data behind the 87% time saving we achieved in a 3,456-run DoE to characterize an enzymatic assay by combining the Antha software and the dragonfly® discovery dispenser
- Discuss how to eliminate bottlenecks in DoE planning, execution and data structuring

This webinar is recommended for:

- Scientists in discovery, assay development and screening who want to work smarter and faster
- DoE practitioners looking for better software and automation solutions to establish DoE as a routine method within their teams
- Scientists and managers who are curious about the productivity gains made possible by DoE

To Join the Webinar: Please register at: <https://www.tvworldwide.com/events/nsf/191122/> to view the webinar.

Event: PAESMEM Applicant Webinars

Sponsor: NSF

When: December 12, 2019 2:00 PM - 3:00 PM

Website: https://www.nsf.gov/events/event_summ.jsp?cntn_id=299254&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: 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.cuny.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.cny.cuny.edu/application-will-be-available-on-october-28-2019/>

Grant Opportunities

National Science Foundation

Grant Program: Next Generation Software for Data-driven Models of Space Weather with Quantified Uncertainties (SWQU)

Agency: National Science Foundation NSF 20-519

RFP Website: <https://www.nsf.gov/pubs/2020/nsf20519/nsf20519.htm>

Brief Description: This solicitation addresses the overlapping objectives of the [National Space Weather Strategy and Action Plan](#) (NSW-SAP) and the [National Strategic Computing Initiative \(NSCI\) Update](#) through a pilot program. The goal of this pilot program is to transform development of predictive modeling of the coupled evolution of the magnetized solar atmosphere and the solar wind, and their interaction with the Earth's magnetosphere and upper atmosphere. This requires advancing our understanding of the necessary and sufficient requirements of model complexity, computational performance, and observational inputs. The pilot program is also expected to directly contribute to the long-term goal of creating space weather models with quantifiable predictive capability.

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

Subject to availability of funds and receipt of sufficient quality proposals; the anticipated total funding amount includes joint funding from NSF and NASA. The awards are expected to be at the level of \$500K-\$1M per year; a total award for three years is expected to be in the range of \$1,500,000 – \$3,000,000.

Letter of Intent: Not Required

Proposal Submission Deadline: March 20, 2020

Contacts: Vyacheslav (Slava) Lukin, Program Director, Division of Physics, telephone: (703) 292-7382, email: vlukin@nsf.gov

- Bogdan Mihaila, Program Director, Division of Physics, telephone: (703) 292-8235, email: bmihaila@nsf.gov
 - Ilia I. Roussev, Program Director, Division of Atmospheric and Geospace Sciences, telephone: (703) 292-8519, email: irussev@nsf.gov
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Grant Program: Semiconductor Synthetic Biology for Information Storage and Retrieval (SemiSynBio-II)

Agency: National Science Foundation NSF 20-518

RFP Website: <https://www.nsf.gov/pubs/2020/nsf20518/nsf20518.htm>

Brief Description: The National Science Foundation (NSF), through its Divisions of Electrical, Communications and Cyber Systems (ECCS), Computing and Communication Foundations (CCF), Molecular and Cellular Biosciences (MCB), and Materials Research (DMR) announces a follow-up solicitation on the Semiconductor Synthetic Biology for Information Storage and Retrieval Program (SemiSynBio-II). Future ultra-low energy storage-based computing systems can be built on principles derived from organic systems that are at the intersection of physics, chemistry, biology, computer science and engineering. Next-generation information storage technologies can be envisioned that are driven by biological principles and use biomaterials in the fabrication of devices and systems that can store data for more than 100 years with storage capacity 1,000 times more than current storage technologies. Such a research effort can have a significant impact on the future of information storage and retrieval technologies. This focused solicitation seeks high-risk/high-return interdisciplinary research on novel concepts and enabling technologies that will address the fundamental scientific issues and technological challenges associated with the underpinnings of synthetic biology integrated with semiconductor technology. This research will foster interactions among various disciplines including biology, physics, chemistry, materials science, computer science and engineering that will enable in heretofore unanticipated breakthroughs.

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

Individual projects will be funded at up to \$1,500,000 for three years depending on the availability of funds.

Letter of Intent: Not Required

Proposal Submission Deadline: February 14, 2020 - March 16, 2020

Contacts: Usha Varshney, Program Director, ENG/ECCS, telephone: (703) 292-8339, email: uvarshne@nsf.gov

Mitra Basu, Program Director, CISE/CCF, telephone: (703) 292-8910, email: mbasu@nsf.gov

Elebeoba E. May, Program Director, BIO/MCB, telephone: (703) 292-2100, email: emay@nsf.gov

Grant Program: Environmental Convergence Opportunities in Chemical, Bioengineering, Environmental, and Transport Systems (ECO-CBET)

Agency: National Science Foundation NSF 20-517

RFP Website: <https://www.nsf.gov/pubs/2020/nsf20517/nsf20517.htm>

Brief Description: Creating solutions to pressing environmental and sustainability challenges will require input and imaginative approaches from various fields, perspectives, and disciplines. The National Academies of Sciences, Engineering and Medicine (NASEM), in their report "[Environmental Engineering for the 21st Century: Addressing Grand Challenges](#)," identified five critical challenges we must address as a society:

- Sustainably supply food, water, and energy
- Curb climate change and adapt to its impacts
- Design a future without pollution and waste
- Create efficient, healthy, and resilient cities
- Foster informed decisions and actions

The report further states, "The challenges provide focal points for evolving environmental engineering education, research, and practice toward increased contributions and a greater impact. Implementing this new model will require modifications in educational curriculum and creative approaches to foster interdisciplinary research on complex social and environmental problems." This solicitation aims to address these grand challenges by supporting a collaborative research model that seamlessly integrates sustainability, environmental engineering, and process science and engineering.

Accordingly, the Environmental Convergence Opportunities in Chemical, Bioengineering, Environmental, and Transport Systems (ECO-CBET) solicitation will support activities that confront vexing environmental engineering and sustainability problems by uncovering and incorporating fundamental knowledge to design new processes, materials, and devices from a systems-level perspective. Projects should be compelling and reflect sustained, coordinated efforts from interdisciplinary research teams. A key objective of the solicitation is to encourage conversations and robust collaborations amongst the chemical process, transport phenomena, bioengineering, and environmental and sustainability research communities such that unanticipated solutions may arise. Furthermore, training the future workforce to actively engage and be successful in interdisciplinary research will be necessary to continually innovate given the scope of the environmental problems faced by our global community.

Awards: Continuing grants. Anticipated Funding Amount: \$8,500,000

Letter of Intent: Not Required

Pre-Proposal: Required; Due on February 12, 2020

Proposal Submission Deadline: April 30, 2020

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

Bruce K. Hamilton, telephone: (703) 292-7066, email: bhamilto@nsf.gov

Robert McCabe, telephone: (703) 292-4826, email: RMCCABE@nsf.gov

Grant Program: Improving Undergraduate STEM Education: Pathways into the Earth, Ocean, Polar and Atmospheric & Geospace Sciences (IUSE:GEOPATHS)

Agency: National Science Foundation NSF 20-516

RFP Website: <https://www.nsf.gov/pubs/2020/nsf20516/nsf20516.htm>

Brief Description: Through the IUSE framework, NSF coordinates its investments in undergraduate programs and undergraduate STEM education to maximize impact, and to use shared metrics and appropriate program evaluation approaches. These investments are made across all directorates and address both STEM education in general and specific disciplinary needs. IUSE investments support a variety of activities including the inclusion of inquiry-based and active learning approaches in undergraduate STEM instruction, efforts to increase undergraduate STEM research experiences and courses, and research on the persistence and graduation of students in STEM programs. In addition, specific emerging cross-disciplinary needs include data science preparation for students in all majors,

recruitment and retention of women and of students from underrepresented groups in STEM degree programs, incorporation of undergraduate research in STEM fields for STEM majors and non-majors, and re-envisioning of introductory courses in light of new research findings and theories. IUSE also seeks to broaden participation in STEM fields from all sectors and groups in society and proposers are encouraged to establish linkages, as appropriate, with components of the national network of NSF INCLUDES projects [Reference 2 in the Program Description section].

The Directorate for Geosciences (GEO) contributes to the IUSE initiative through the *Improving Undergraduate STEM Education: Pathways into the Geosciences - Earth, Ocean, Polar and Atmospheric Sciences (IUSE:GEOPATHs)* funding opportunity. IUSE:GEOPATHs invites proposals that specifically address the current needs and opportunities related to education within the geosciences community through the formation of STEM Learning Ecosystems that engage students in the study of the Earth, its oceans, polar regions and atmosphere. The primary goal of the IUSE:GEOPATHs funding opportunity is to increase the number of students pursuing undergraduate and/or postgraduate degrees through the design and testing of novel approaches that engage students in authentic, career-relevant experiences in geoscience. In order to broaden participation in the geosciences, engaging students from historically excluded groups or from non-geoscience degree programs is a priority. While maintaining elements from the legacy tracks of GEOPATHS, this solicitation features three new funding tracks that focus on Geoscience Learning Ecosystems (GLEs):

1. GEOPATHs: *Informal Networks (IN)*. Collaborative projects in this track will support geoscience learning and experiences in informal settings for teachers, pre-college (e.g., upper level high school) students, and early undergraduates in the geosciences.
2. GEOPATHs: *Undergraduate Preparation (UP)*. Projects in this track will engage pre-college and undergraduate students in extra-curricular experiences and training in the geosciences with a focus on service learning [Reference 3 in the Program Description section] and workplace skill building.
3. GEOPATHs: *Graduate Opportunities (GO)*. Projects in this track will improve research and career-related pathways into the geosciences for undergraduate and graduate students through institutional collaborations with a focus on service learning and workplace skill building.

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

Letter of Intent: December 20, 2019; November 17, 2020

Proposal Submission Deadline: February 14, 2020, January 26, 2021

Limit on Number of Proposals per Organization: An organization may serve as sole submitting organization or as lead organization of a collaborative project on only one submission per competition, regardless of track, but may serve as the non-lead organization of a collaborative project more than once per competition. Additional eligibility requirements are described later in the solicitation.

Internal Notification and Competition: If you are interested in submitting a proposal, please send an email with proposal summary, list of investigators and budget summary to Atam Dhawan at dhawan@njit.edu by November 20, 2019.

Contacts: M. Brandon Jones, GEO/OAD, telephone: (703) 292-4713, email: mbjones@nsf.gov

Elizabeth L. Rom, GEO/OCE & GEO/OPP, telephone: (703) 292-7709, email: elrom@nsf.gov

Amanda (Manda) S. Adams, GEO/AGS, telephone: (703) 292-8521, email: amadams@nsf.gov

Grant Program: Future of Work at the Human-Technology Frontier: Core Research (FW-HTF)

Agency: National Science Foundation NSF 20-515

RFP Website: <https://www.nsf.gov/pubs/2020/nsf20515/nsf20515.htm>

Brief Description: The Future of Work at the Human-Technology Frontier (FW-HTF), one of the Big Ideas, is one mechanism by which NSF is responding to the challenges and opportunities for the future of jobs and work. The overarching vision is to support convergent research to understand and develop the

human-technology partnership, design new technologies to augment human performance, illuminate the emerging socio-technological landscape, understand the risks and benefits of new technologies, understand and influence the impact of artificial intelligence on workers and work, and foster lifelong and pervasive learning.

The landscape of jobs and work is changing at unprecedented speed, enabled by advances in computer science and engineering, deeper understanding of societal and environmental change, advances in the learning sciences, and new conceptions of work and workplaces. This technological and scientific revolution presents a historical opportunity to the Nation and its people, in the creation of new industries and occupations, enhanced productivity and quality of work life, and the potential for more people to participate in the workforce, ultimately yielding sustained innovation and global leadership. But, as history teaches, such changes also come with risks. Some risks are immediate, such as jobs lost to automation or demand for skills not met by current educational pathways. Other equally important risks include new security threats, algorithmic biases, unanticipated legal consequences including privacy implications, dependence on technology and erosion of human knowledge and skills, inadequate workplace policies and practices, or undesirable impact on the built environment.

The specific objectives of the Future of Work at the Human-Technology Frontier program are to (1) facilitate convergent research that employs the joint perspectives, methods, and knowledge of computer science, design, engineering, learning sciences, research on education and workforce training, and social, behavioral, and economic sciences; (2) encourage the development of a research community dedicated to designing intelligent technologies and work organization and modes inspired by their positive impact on individual workers, the work at hand, the way people learn and adapt to technological change, creative and supportive workplaces (including remote locations, homes, classrooms, or virtual spaces), and benefits for social, economic, educational, and environmental systems at different scales; (3) promote deeper basic understanding of the interdependent human-technology partnership to advance societal needs by advancing design of intelligent work technologies that operate in harmony with human workers, including consideration of how adults learn the new skills needed to interact with these technologies in the workplace, and by enabling broad workforce participation, including improving accessibility for those challenged by physical or cognitive impairment; and (4) understand, anticipate, and explore ways of mitigating potential risks arising from future work at the human-technology frontier. Ultimately, this research will advance understanding of how technology and people interact, distribute tasks, cooperate, and complement each other in different specific work contexts of significant societal importance. It will advance the knowledge base related to worker education and training and formal and informal learning to enable all potential workers to adapt to changing work environments. It will advance our understanding of the links between the future of work at the human-technology frontier and the surrounding society, including the intended potential of new technologies and the unintended consequences for workers and the well-being of society.

For the purposes of this solicitation, work is defined as mental or physical activity to achieve tangible benefit such as income, profit, or community welfare. The Future of Work at the Human-Technology Frontier is, in turn, a conceptualization of work in the future that will be enabled or improved by advances in intelligent technology and their synergistic integration with human skill to achieve broad participation in the workforce and improve the social, economic, and environmental well-being of society. To reach this goal, research is sought that is anchored in work. Proposals must clearly define the work and work context addressed by the research. Technological innovations should be integrated with advances in the learning sciences, research on education and workforce training, and social, behavioral, and economic science perspectives. Potential results should contribute to fundamental advances in optimizing the human-technology team, the science and technology of future workforce development and education, work environments, and positive work outcomes for workers and society at large. Proposals are

encouraged that are oriented toward the future of work at the human-technology frontier and that are not overly couched in current technology or work practices.

A proposal for a research grant in this program must focus on advancing fundamental understanding of future work, and potential improvements to work, workplaces, workforce preparation, or work outcomes for workers and society. It must be convergent research that addresses the human and societal dimensions as well as the technological innovation and their potential impact on future work. In doing so, the research should make significant contributions to both intellectual merit and broader impact. Achieving this goal requires integration and convergence of disciplines across behavioral science, computer science, economic science, engineering, learning sciences, research on education and workforce training, and the social sciences. A convergent perspective is essential to understand and shape long-term social and economic drivers, so that advanced intelligent technology will strengthen the social fabric. A convergent perspective also provides insights into education and re-skilling, so that the benefits of emerging technology can be conferred upon both current and future workers.

Awards: Standard grants. Anticipated Funding Amount: \$30,000,000. Up to 15 Planning Grant Awards and up to 15 Research Grant Awards.

Two classes of proposals will be considered through this solicitation:

1. FW-HTF Planning Grants (FW-HTF-P) may be requested for a total budget not to exceed \$150,000 for a period of 1 year.
2. FW-HTF Research Grants (FW-HTF-R) may be requested at two levels:
 - a. Medium FW-HTF-R proposals may request support for a period of up to 3 years, with a total budget not to exceed \$1,500,000.
 - b. Large FW-HTF-R proposals may request support for a period of up to 4 years, with a total budget between \$1,500,001 and \$3,000,000.

Letter of Intent: Not Required

Proposal Submission Deadline: March 09, 2020

Contacts: Address General Questions to, telephone: (703) 292-5365, email: fwhtf-contacts@nsf.gov
Stephanie E. August, EHR/DUE, telephone: (703) 292-5128, email: fwhtf-contacts@nsf.gov
Amy L. Baylor, EHR/DRL, telephone: (703) 292-5126, email: fwhtf-contacts@nsf.gov

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

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

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

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 groundbreaking, 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

National Institutes of Health

Grant Program: Utilizing Invasive Recording and Stimulating Opportunities in Humans to Advance Neural Circuitry Understanding of Mental Health Disorders (R01 and R21 Clinical Trial Optional)

Agency: National Institutes of Health RFA-MH-20-350 RFA-MH-20-351

RFP Website: <https://grants.nih.gov/grants/guide/rfa-files/RFA-MH-20-350.html>

<https://grants.nih.gov/grants/guide/rfa-files/RFA-MH-20-351.html>

Brief Description: Research related to this initiative may include, but is not limited to, studies of:

- Acute intra-operative recordings from single-unit or strip electrodes.
- Mood evaluations or mental health-relevant cognitive/behavioral tasks that can be completed in the operating room should be included.
- Quantification of behaviors (e.g., facial expression, vocal expression) that may be associated with internal subjective states (e.g., mood, thoughts/impulses, perceptions) may be explored to tag simultaneously acquired neurophysiological signals to elucidate circuits related to subjective states relevant for psychiatric disorders.

Sub-acute recordings from the epilepsy monitoring unit or related situations.

- Patients with ECoG or stereo-electroencephalography (sEEG, which may be underutilized in human neuroscience studies) electrodes could participate in a variety of tasks, depending on the placement of electrodes (e.g., amygdala, orbitofrontal cortex, or anterior cingulate cortex).
- Mood variations could be assessed using ecological momentary assessment (EMA) and other digital health tools to correlate mood/cognitive/behavioral fluctuations with neural circuitry changes. Researchers could stimulate portions of the network to assess the effect on network dynamics and behavior.

Chronic recordings from recording/stimulating deep brain stimulating (DBS) systems.

- Patients implanted for a clinical indication, either for a mental health disorder or not, can participate in research aimed at exploring relevant networks (though treatment development should not be the focus of the proposed research).
- Assessments of network stability and responses to perturbations, along with their relationship to long-term/dense behavioral measures and digital phenotyping, can be included.

Research Domain Criteria (RDoC)-based circuit assessments.

- Researchers could use RDoC-inspired paradigms in the above clinical scenarios to assess the relevant neural circuits of cognitive, affective, and social domains at a higher spatial and temporal precision than possible with non-invasive measures.

Novel technological approaches.

- Novel methods of neural or behavioral recording and stimulation are encouraged. This could include novel electrodes, recording devices, or digital phenotyping/dense behavioral trackers. However, this FOA does not support the stand-alone development of novel technology. New methods should be incorporated into an underlying scientific question.

Prospective or retrospective data.

- Both prospective or retrospective data can be utilized for this funding opportunity.

The companion R21 grant mechanism of this funding opportunity encourages shorter, higher-risk applications with little (or no) preliminary data.

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

Letter of Intent: Not Applicable

Deadline: February 10, 2020; October 9, 2020; June 10, 2021

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

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 Program for Enhancing Neuroscience Diversity through Undergraduate Research Education Experiences (BP-ENDURE) (R25 Clinical Trial Not Allowed)

Agency: National Institutes of Health RFA-NS-20-015

RFP Website: <https://grants.nih.gov/grants/guide/rfa-files/RFA-NS-20-015.html>

Brief Description: The NIH Research Education Program (R25) supports research education activities in the mission areas of the NIH. The over-arching goal of this R25 program is to support educational activities that encourage individuals from diverse backgrounds, including those from groups underrepresented in the biomedical and behavioral sciences, to pursue further studies or careers in research

To accomplish the stated over-arching goal, this FOA will support creative educational activities with a primary focus on:

- *Research Experiences*
- *Mentoring Activities*
- *Courses for Skills Development*

The fully integrated educational activities should prepare undergraduate students from diverse backgrounds, including those from groups underrepresented in biomedical and behavioral sciences to enter Ph.D. degree programs in the neurosciences. To accomplish this goal, this initiative will provide institutional awards to develop neuroscience research education programs comprised of collaborative partnerships integrated across different educational institution types.

The overall objective of this funding opportunity is to support a diverse pool of undergraduates, including those from underrepresented groups, to help prepare them to successfully enter and complete Ph.D. degree programs in the neurosciences and become available to participate in NIH-supported neuroscience research. Individuals currently underrepresented in neuroscience research on a national basis (for example [see surveys](#) conducted by the [Society for Neuroscience Committee on Neuroscience Departments and Programs](#)), include: individuals from underrepresented racial and ethnic groups or individuals with disabilities (see also <http://www.nsf.gov/statistics/wmpd/>).

Award: Although the size of award may vary with the scope of the research education program proposed and there are no specific budget limitations, the requested direct costs must be reasonable, well documented, fully justified and commensurate with the scope of the proposed program. The average cost per program is estimated between \$250K - \$300K.

Letter of Intent: January 19, 2020

Deadline: February 19, 2020, by 5:00 PM local time of applicant organization. All [types of non-AIDS applications](#) allowed for this funding opportunity announcement are due on these dates.

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: NEI Center Core Grant for Vision Research (P30 Clinical Trial Not Allowed)

Agency: National Institutes of Health PAR-20-051

RFP Website: <https://grants.nih.gov/grants/guide/pa-files/PAR-20-051.html>

Brief Description: A NEI Center Core Grant should increase the productivity and impact of research in eligible projects of the Core users, and should create a collaborative environment to increase scientific interactions. A strong research base of funded projects is an eligibility requirement and a major factor in obtaining an NEI Center Core Grant award. Any institution or consortium applying for a NEI Center Core Grant must have an active, established program in basic, epidemiological, biomedical or behavioral research in one or more of the NEI mission areas described at <https://www.nei.nih.gov/funding/nprp>.

Specific Areas

NEI-supported Center Cores should consist of discrete units or Cores, each devoted to a specific activity that would be impractical or less efficient to support on an individual research project grant. The purpose of each Core is to support a resource or service that enhances or facilitates the research efforts of a group of independent investigators, each having NEI funding. Cores may involve the purchase and maintenance of shared instruments. Sharing of NEI Center Core Grant resources and services with other NIH-funded collaborators and with investigators new to vision research is encouraged.

The **Administrative Core** supports the overall management of the Center Core which includes an organizational structure sufficient to coordinate and integrate the activities of the Resource and Service Cores, and to determine the distribution and utilization of funds.

Resource Cores facilitate the production of materials for research, or support the purchase, maintenance, and technical support of shared equipment. Examples may include, but are not limited to: confocal microscopy, electron microscopy, tissue and cell culture services, genotyping, microarray analysis, mass spectrometry, high throughput sequencing, database management, hybridoma production, laboratory animal resources, image analysis, and brain and eye imaging. Resource Cores may also help support computer experts, biostatisticians, and other individuals who can assist or collaborate with participating investigators in conducting vision research.

Service Cores support essential laboratory or technical services provided by one or more highly skilled persons. Examples of this type of core include, but are not limited to an electronics shop, a machine shop, and photography services.

Award: Institutions may request direct costs of up to \$2,000,000 over a five-year period in support of a Core Grant to institutions having 8 to 19 eligible grants. Institutions having 20 or more eligible grants may request direct costs of up to \$2,500,000 over a five-year period.

Letter of Intent: Not Applicable

Deadline: September 30, 2020; September 30, 2021; September 30, 2022

All applicants 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: 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 existing 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-notice>

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-notice>

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.

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

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

Agency: Department of Defense Naval Research Laboratory N66001-19-S-4701

Website: <https://govtribe.com/opportunity/federal-contract-opportunity/c4isr-information-operations-cyberspace-operations-and-information-technology-system-n6600119s4701>

Brief Description: The Naval Information Warfare Center, Pacific (NIWC Pacific) is soliciting white papers and proposals in accordance with Federal Acquisition Regulation (FAR) 6.102(d)(2), FAR 35.016 and Department of Defense Grant and Agreement Regulations (DoDGARS) 22.315(a) which provides for competitive selection of basic research, applied research, advanced technology development, and advanced component development and prototype (hereinafter referred to as research). Submissions in response to this announcement shall be for areas relating to the advancement of Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) capabilities, enabling technologies for Information Operations and Cyberspace Operations, and Information Technology systems. Accordingly, proposals selected for award are considered to be the result of full and open competition and fully compliant with PL 98-369, "The Competition in Contracting Act of 1984." This BAA is for procurement contracts (hereinafter referred to as contracts), grants, cooperative agreements, and other transactions. Proposed research should investigate unique and innovative approaches for defining and developing next generation integratable C4ISR capabilities and command suites.

Awards: Various

Proposal Deadline: May 13, 2020 ((white papers and proposals are due by 4:00pm Pacific Time Zone on the closing date)

Contact Information: David Roden (Primary)

Contract Specialist

Telephone: (619) 553-2087

Email: David.Roden@navy.mil

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

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

Brief Description: The Naval Research Laboratory (NRL) The Naval Research Laboratory (NRL) is the Navy's corporate laboratory. NRL conducts basic and applied research for the Navy in a variety of scientific and technical disciplines. The basic research program is driven by perceptions about future requirements of the Navy. NRL conducts most of its research program at its own facilities but also funds some related research such as anticipated by this announcement. More extensive research support opportunities are available from the Naval Research Laboratory (NRL). NRL announcements may be accessed via the Internet at <https://www.nrl.navy.mil/doingbusiness/contracting-division/baa>.

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

Awards: Various

Proposal Deadline: September 05, 2020

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

[General Inquiries](#)

Grant Program: Air Superiority Technology Broad Agency Announcement

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

Website:

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

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

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

RESEARCH AREA 2 – INNOVATIVE AIRCRAFT INTEGRATION TECHNOLOGIES The objective of this work is to design, develop, and demonstrate innovative aircraft integration technologies including

but not limited to physical, electrical, and logical interfaces; and other aspects of aircraft integration that may be applicable.

RESEARCH AREA 3 – FIND-FIX-TARGET-TRACK (F2T2) & DATALINK TECHNOLOGIES The objective of this work is to design, develop, and demonstrate innovative Find, Fix, Target, and Track (F2T2) technologies for the detection of threats to aircraft. These F2T2 technologies should provide threat warning, threat characteristics, You Are The One (YATO) or You Are Not The One (YANTO) discrimination, highly accurate threat cueing, range and range rate, and other pertinent information required to analyze and coordinate a response to a threat.

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

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

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

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

RESEARCH AREA 8 – ADVANCED WARHEAD TECHNOLOGIES

More areas; Please see the BAA on above website.

Awards: Various

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

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

david.hartline.1@us.af.mil

Grant Program: 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

Department of Agriculture:

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

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

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

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

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

Submission Deadline: February 27, 2020

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

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

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

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

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

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

Submission Deadline: September 30, 2020

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

Department of Labor

Grant Program: Apprenticeships: Closing the Skills Gap

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

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

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

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

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

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

Anticipated Funding: \$100,000,000

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

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

EPA

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

Agency: NJ Department of Environmental Protection

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

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

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

Submission Deadline: December 13, 2019

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

fredrik.khayati@dep.nj.gov

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: FLEXIBLE CARBON CAPTURE & STORAGE (FLECCS)

FLEXIBLE CARBON CAPTURE & STORAGE (FLECCS) - SBIR/STTR

Agency: Department of Energy DE-FOA-0002220 DE-FOA-0002221

Website: <https://arpa-e-foa.energy.gov/#FoaId48a01f15-53a5-42d0-9650-d07e36f404cd>

Brief Description: The objective of the FLExible Carbon Capture and Storage (FLECCS) program is to fund the development of carbon capture and storage (CCS) technologies that enable power generators to be responsive to grid conditions in a high variable renewable energy (VRE) penetration environment. This includes retrofits to existing power generators as well as greenfield systems with a carbon-containing fuel input and electricity as an output (i.e., a "black box" in which the nature of the fuel-to-electricity conversion process is not prescribed).

The value of such CCS technologies will be evaluated by their impact on the system LCOE of a net-zero carbon electricity grid, as determined by capacity expansion modeling. ARPA-E does not expect every CCS technology itself to be a net-zero carbon process; instead the cost and performance of each project selected under this FOA will be evaluated in the context of a net-zero carbon system which may include negative emission assets. Recent work suggests that a system LCOE of \$75/MWh for a net-zero carbon electricity system is aggressive yet possible.

FLECCS is a 2-phase program. Phase 1 focuses on designing and optimizing innovative CCS processes that enable flexibility on a high-VRE grid. Phase 1 will last for approximately 15 months and include approximately \$7 million in Federal funding. Based on the output of the individual projects, engineering design review, and capacity expansion analysis, ARPA-E will select projects to continue to the next phase. Phase 2 will focus on building components, unit operations, and small prototype systems to reduce the technical risk and cost associated with these CCS systems. This phase will last for approximately 3 years and have a total budget of approximately \$36 million in Federal funding.

Awards: Various; Available Funding: \$43,000,000

Proposal Submission Deadline: The deadline for Concept Papers is December 23, 2019. Applicants are strongly encouraged to submit their applications at least 48 hours in advance of the submission deadline.

- **Contact:** ExchangeHelp@hq.doe.gov

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

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

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

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

Agency: Department of Energy DE-FOA-0002181

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

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

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

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

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

Contact: SC.Grantsandcontracts@science.doe.gov

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

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

Grant Program: ROSES 2019: Heliophysics System Observatory Connect

Agency: NASA NNH19ZDA001N-HSOC

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

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

Awards: Various

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

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

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](#)

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-DD75-0230277DDD&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://lwstr.gsfc.nasa.gov/>). The LWS Science program maintains a strategy with three components, namely, Strategic Capabilities,

Targeted Investigations, and CrossDisciplinary Infrastructure Building programs. Only the Targeted Investigations will be competed in this announcement. Proposers interested in Strategic Capabilities should see Program Element B.10 Living With a Star Strategic Capabilities. Cross-Disciplinary Infrastructure Building may be competed in ROSES-2020.

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

Notice of Intent: Contact the program officer

Proposal Deadline: Step 1 Proposals Due December 05, 2019

Contact: Simon Plunkett Heliophysics Division Science Mission Directorate National Aeronautics and Space Administration Washington, DC 20546-0001 Telephone: (202) 358-2034 Email:

simon.p.plunkett@nasa.gov

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

Agency: NASA NNH19ZDA001N-SWO2R

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

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

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

Awards: Various

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

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

National Endowment of Humanities

Grant Program: Institutes for Advanced Topics in the Digital Humanities

Agency: National Endowment for the Humanities 20200305-HT

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

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

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

Awards: Maximum award amount: \$250,000

Deadlines: Optional Draft Due: January 29, 2020

Application due: March 5, 2020

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

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

National Geographic

Grant Program: Biodiversity Exploration and Discovery

Agency: National Geographic

Website:

<https://www.nationalgeographic.org/funding-opportunities/grants/what-we-fund/biodiversity-exploration-and-discovery/>

Brief Description: Proposals that focus on the following themes are encouraged: inventories, surveys, and research expeditions focused areas of endemism and richness; aimed at developing conservation strategies related to new discoveries as they are made; and those that better understand the patterns of biological diversity, including distribution and abundance of poorly known groups. Projects that include the active involvement of early-career conservationists are encouraged. Preference will be given to proposals from applicants residing in the country of fieldwork. All proposals must include at least one team member from the country where the fieldwork takes place.

Awards: Applicants may request up to \$50,000, with clear budget justification for use of the grant. Successful applicants should use awarded funds within one year.

Proposal Deadline: January, 2020.

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/>

Proposal Submission and Streamlyne Information

Internal Timeline for Successful and Timely Proposal Submission

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

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

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

- **1 month (or earlier) before the due date:** initiate the proposal submission process in Streamlyne with a notice of intent to apply to college POC and SRA including the request for proposal identification number (NSF, NIH) and/or the RFP document. This is an important step that will help the College POC and SRA to manage your proposals. It will allow:
 - preliminary review of needs and sponsor requirements (meeting recommended)
 - set up the timeline in motion and internal checklist/deadlines
 - collaborator outreach and intake requirements (where applicable)
 - set up the budget and Streamlyne document development process including any cost-sharing for consideration of department, college and office of research administration.
- **1 month - 2 weeks before due date:** the budget should be finalized and the approval process should be initiated. This includes the department and college approvals, conflict of interest forms, the detailed budget and justification, proposal title, and preliminary specific aims (NIH), proposal summary (NSF), or contract scope of work (SOW). The following checklist should be followed:
 - Proposal budget
 - Internal budget commitments such as cost-sharing should be fully calculated/loaded at this time. Any college specific internal process for index source and approvals should be followed within this timeline.
 - Complete initial proposal details and internal Streamlyne information
 - Complete Streamlyne questionnaires
 - Proposal specific
 - Sponsor specific (as applicable for grants.gov for S2S submission)
 - Complete special review disclosures (as applicable)
 - IRB/human subjects
 - Biosafety
 - Animals

- Export Controls
 - Conflict of Interest
- **2 weeks - 1 week before the due date:** submit all required internal attachments including:
 - Project Summary/Statement of Work
 - Final Budget
 - Budget Justification
 - For S2S Proposals – Complete additional input of placeholder attachments.
 - Submit in Streamlyne and monitor routing/review by key personnel and department/college administration.
- **72 hours – 24 hours before the submission deadline:** Prepare the final version for submission. The following actions will be managed during this period.
 - All final technical documents/attachments are completed and validated in internal and/or sponsor system(s).
 - Central Office completes final review and coordination with PI and College POC on final proposal review, validation of system requirements and engages in sponsor actions and submission.
 - Central office completes internal data and archiving procedures and coordinates follow-up
- **At least 24 hours before the submission deadline:** The PI should release the final version of the proposal to the SRA office at least 24 hours prior to the deadline for on-time submission.

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

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

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

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

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

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

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

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

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.

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.
