

UPR external funding success is of utmost importance to strengthen the connection between its investigators/faculty and funding entities who have the potential to sponsor their research and academic endeavors. This publication has been developed in order to summarize funding opportunities and promote the participation of faculty and collaborative research groups in their intent to apply for external funds. Such efforts are aligned with the UPR Strategic Plan 2017-2022: A New Era of Innovation and Transformation for Student Success; Certification 50 (2016-2017) of the Governing Board, December 19, 2016. Strategic Area: Research and Creative Work. Goal 2: Increase Applications for and awards of external funds for research and creative work.

SELECTED FUNDING OPPORTUNITIES

This is a selection of identified funding opportunities for the period ending 10/02/2020 and is in no way all-inclusive of funding opportunities available. Further information has been shared with External Resource Coordinators and Research Coordinators at each UPR campus by e-mail or MS Teams.

1. Sustainability of the Internet, Internet Society Foundation

Application Deadline: Rolling

The [Internet Society Foundation](#) has announced a new grants program in support of researchers worldwide who are studying the future and sustainability of the Internet. Through the program, grants of up to \$200,000 over two years are available for research focused in one of two categories:

Greening the Internet — The Internet both affects and is affected by the environment and climate change. Having a critical awareness of this impact is key to the Internet's resilience and ensures its sustainability for generations to come. This awareness may include an assessment of energy consumption by the Internet, or the toxins and waste generated by its use. It may consider the enabling effect the Internet has on other sectors to limit greenhouse gas emissions. It may examine the ways in which climate change and extreme weather threatens Internet infrastructure and limits connectivity. Research focused on Greening the Internet should promote an awareness of these and other issues concerning the Internet's environmental footprint and the sustainability measures needed for it and the planet to thrive.

The Internet Economy — New and emerging Internet-based activities have the power to disrupt the economic landscapes and lead to unpredictable economic futures. Having a firm grasp of the interactions that create the Internet Economy has the potential to reshape this uncertainty. Unpacking how the Internet transforms traditional ideas about competition, production, and consumption of goods and services could be useful in allowing for equitable and gainful participation of everyone in a rapidly digitizing global economy. Research proposals focusing on the Internet Economy should present an analysis of past or present ecosystems that yields insight into the future of the Internet and its dependent market(s).

The program is open to independent researchers and research institutions worldwide. To be eligible, researchers should have a postgraduate research degree (PhD, Masters) and publications/patents in the relevant area, Research institutions should be tax exempt under section 501(c)(3) of the Internal Revenue Code (or equivalent) and should have a mission that is aligned with that of the foundation.

Statements of Interest will be accepted beginning September 1. Full proposals will be accepted by invitation on a rolling basis thereafter.

Researchers will be asked to complete a statement of interest that outlines the following:

- What is the thematic area of focus?
- What is your research question? What do you seek to answer?

- Why is this a novel research question? How does this differ from previous research on the same or similar topic?
- How can this research be applied? What practical problem does this research solve?
- Who is the principal investigator?
- Who are your potential collaborators? Why have you chosen them?

Link to Additional Information: <https://www.isocfoundation.org/grant-programme/research-grant-programme/>

2. National Geospatial Intelligence Agency Boosting Innovative GEOINT Research Broad Agency Announcement (NGA BIG-R BAA), Department of Defense, National Geospatial-Intelligence Agency

Application Deadline: Open until July 31, 2023

NGA welcomes all innovative ideas for path-breaking research that may advance the GEOINT mission. The mission of the National Geospatial-Intelligence Agency (NGA) Research Directorate is to deliver future Geospatial-Intelligence (GEOINT) capabilities to users for operational impact. NGA Research supports the National Security Strategy by solving hard defense and intelligence problems for the Intelligence Community and Department of Defense. GEOINT is the exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on the Earth. GEOINT consists of imagery, imagery intelligence, and geospatial information. NGA offers a variety of critical GEOINT products in support of U.S. national security objectives and Federal disaster relief, including aeronautical, geodesy, hydrographic, imagery, geospatial and topographical information.

The Boosting Innovative GEOINT-Research Broad Agency Announcement (BIG-R BAA) invites proposers to submit innovative basic and applied research and development concepts that address one or more of the following technical domains:

- (1) Foundational GEOINT - The Foundational GEOINT portion of the Research portfolio focuses on the creation of always accurate, high-resolution, continually updated representations of the earth's properties, available on demand. Topics of interest in this domain include, but are not limited to, innovations advancing the GEOINT physical sciences in the areas of: (1) terrestrial/celestial reference frames, (2) earth gravitational models, (3) world magnetic models, (4) assured positioning, navigation and timing, and resilience, (5) geopositioning, (6) feature extraction, attribution, classification and modeling, (7) infrastructure models, (8) human geography and environmental models, (9) bathymetric/topological models, and (10) maritime environmental mapping.
- (2) Advanced Phenomenologies - The Advanced Phenomenologies portion of the portfolio employs novel methods and efficient strategies to drive development and delivery of improved spatially, spectrally and temporally resolved data from a growing number of traditional and non-traditional sources. Topics of interest in this domain include, but are not limited to, innovations advancing the design and development of algorithms, components, and enabling technologies for systems in the areas of: (1) detection, tracking, and identification of the most challenging targets in complex environments, (2) sensing and real-time processing of both static and dynamic targets, (3) novel source exploitation and optimization, (4) collection technologies to optimize use of phenomenology sources, (5) space situational awareness, (6) information assurance, data integrity and quality validation, (7) error propagation modeling, and (8) multi-domain data aggregation.
- (3) Analytic Technologies - The Analytic Technologies portion of the portfolio enhances the definition and utility of GEOINT by leveraging new sources of data and developing novel analytic techniques to deliver a geospatial dimension to multi-INT analytics, in particular to address emerging threats and mission domains. New data sources drive us of these technologies to provide accurate, timely, reliable and scalable methods for data exploitation, integration, and analysis. Topics of interest in this domain include, but are not limited to, innovations in advanced processing techniques and enabling technologies for (1) geospatial signatures detection, analysis, and tracking, (2) derivation of GEOINT from non-traditional data in cyberspace, (3) stand-off detection of counter proliferation and chemical, biological, radiological, nuclear and explosive activities, (4) water security, (5) image/video understanding and computer vision, (6) image and product standards development and enhancement, (7) automatic target recognition, (8) temporal and activity modeling and contextualization, (9) event forecasting and prediction, (10) knowledge and ontology modeling, (11) artificial intelligence, to include novel learning techniques, (12) automation, to include software tools, (13) natural language processing, (14) social media analytics, (15) location-based insights, (16) workflow effectiveness and analyst workflow modernization, (17) human-machine interaction, (18) tools that provide better human understanding of automated solutions, (19) tools to guide algorithm and automation governance, and (20) immersive GEOINT visualization tools.

It is NGA's intent to solicit basic and applied research under this BAA. NGA seeks proposals from qualified proposers for path-breaking GEOINT research in areas of potential interest to NGA.

Link to Additional Information: Go to www.grants.gov and search for opportunity number: **HM0476-20-BAA-0001**

3. Enabling Gasification of Blended Coal, Biomass and Plastic Wastes to Produce Hydrogen with Potential for Net Negative Carbon Dioxide Emissions, Department of Energy, National Energy Technology Laboratory

Application Deadline: November 22, 2020

The overarching objective of this FOA and single Area of Interest is to generate lab-scale data and experience to further encourage the development of technologies and commercial approaches to enable a hydrogen-based energy economy while achieving net-negative CO₂ emissions through gasification of coal, biomass, and carbonaceous mixed wastes such as plastics.

Projects funded under this FOA must perform R&D to address a technology gap that would achieve objective(s) as described in the following area of interest (AOI):

- Co-gasification of Coal, Biomass and Plastic Wastes for Production of Hydrogen and Fuels with Negative Carbon Potential

The focus of this FOA and single AOI is the advancement of technologies that aim to produce hydrogen or other high-value fuels whether as the sole product or as a co-product as would be the case in a polygeneration facility. Waste plastic is also potentially an ideal feedstock for several existing processes that fall under this category due to its extremely high volatile matter (80-90%) and low moisture and ash (<2-3% total) content. However, further R&D is needed to confirm whether this is the case and to illuminate any potential issues that may arise during plant setup and/or operation. Towards this goal, laboratory-scale testing of varied feedstock compositions, with guidance for standardized feedstock cases supplied via Appendix G of this FOA, and possibly augmented with modeling, is needed to encourage continued technology development.

Objectives

R&D under this AOI will enable gasification technology to utilize coal, waste plastics, and biomass feedstocks to improve the cost, performance, reliability, and flexibility of net negative carbon emitting, polygeneration technologies to produce hydrogen and other hydrogen-based fuels. Current state-of-the-art technology was designed specifically for highly grindable feedstocks like coal or torrefied biomass, with certain ratios of carbon, volatiles, and moisture content. However, there is a deficiency in available data for how plastic materials, exhibiting different physical and chemical structures, will impact the operation of state-of-the-art (SOTA) gasifiers of any given type, including fixed bed, fluidized bed, transport, and entrained flow gasifier types.

To accomplish R&D goals, investigations into the effects of waste plastics, and their combinatorial effects with other co-feed constituents such as various biomass(es) and various coal(s), on gasifier hardware and gasification processes are needed. These investigations at the lab-scale level will yield valuable data to inform future upscaling efforts. Investigations should consist of laboratory experiments to determine the effects of the full range of potential feedstock compositions on the process characteristics (i.e., grinding, milling, conveying, etc.), and resulting products (i.e., syngas compositions, slag characteristics, etc.).

Link to Additional Information: Go to <https://www.fedconnect.net/> and search for opportunity **DE-FOA-0002376**

4. Naval Engineering Education Consortium (NEEC) Broad Agency Announcement for FY20, Department of Defense

Application Deadline: October 30, 2020

This BAA is open only to colleges and universities. On behalf of the Naval Sea Systems Command (NAVSEA) Warfare Centers, NSWC IHEODTD is soliciting research of interest in support of the NEEC. The topics of interest are listed below:

- **CO-01:** Research and development of state-of-the-art, compact, portable, advanced photonic sensors and detectors (including quantum-based) in the emerging measurement technology areas, e.g., Chemical, Biological, Nuclear, Radiological, & Explosives (CBNRE); Autonomous Systems (Robotics, Unmanned Systems [UxS]), etc. Sensor-family designed for zero-chain measurement traceability to International System of Units (SI) using NIST-on-a-Chip (NoaC) technologies, e.g., for Navy platform integration, are of particular interest.
- **CO-02:** Explore the current state of various quantum algorithms and methods of implementing said algorithms for use in data science, cryptography, and machine learning. Use objective measures to assess the feasibility of quantum algorithms versus classical algorithms as things stand at present, including factors that account for any discrepancies and how to address them. Develop new or improved algorithms, including implementations, when a need or opportunity arises.
- **CR-01:** Combined effects of nose bluntness and yaw on turbulent transition over conical nose cones.
- **DD-01:** Hypersonic Thermal Protection Systems: Research into hypersonic vehicle thermo-protection systems (TPS); may include active and passive ablation solutions, hybrids and structural insulators, and related aerothermal, computational fluid

dynamics and fluid/structure interaction methods. Improved prediction of turbulent heating on hypersonic vehicles is desired. Advances in prediction of boundary layer transition on carbonaceous and/or ceramic ablaters, the role of material processes and architecture in the development of surface roughness under hypersonic flow conditions, as well as the mechanisms of property changes of such materials in long term storage conditions. Advances in instrumentation methods for hypersonic TPS are also of interest.

- **DD-02:** Advanced Multi-Purpose High-Temperature Materials: Refractory High-Entropy Alloys (RHEAs) emerge as promising candidate materials for ultra-high-temperature applications. One critical issue to solve for RHEAs is balancing oxidation resistance and mechanical properties, with a particular focus on room temperature ductility. We seek research on advanced RHEAs for casting, machining, additive manufacturing, and surface coating. When hierarchical matrixed parts are produced using additive manufacturing, consistency is extremely important for ensuring reliability. High reliability requires development of safety factors, established through detailed understanding of their fracture mechanics. We seek research on the fracture mechanics of hierarchical matrixed parts produced through additive manufacturing. We seek research into industrial manufacturing techniques related to mixing in a lamellar flow environment to create highly loaded composites with exotic properties. We desire a research approach to investigate how highly loaded nanostructured composites are constituted under extensional mixing. An understanding of phenomena that occurs between the matrix and nanomaterial, and how one achieves unique material properties is desired.
- **DD-03:** Software Assurance and Cybersecurity: Automate formal verification and other software assurance techniques of complex software, given software transformation through automated language translation; employment of network technologies; distributed, edge and cloud deployment; and software scrambling. Software safety and absolute traceability to systems engineering / software design artifacts are specific goals. We seek innovative proposals that seek to explore innovative approaches for educating cybersecurity engineering professionals, engaging them in topics of interest to the naval research enterprise, and enhancing the pipeline of qualified cybersecurity engineering candidates for national security positions.
- **DD-04:** Directed Energy: Hybrid energy storage approaches for increased energy magazines for Directed Energy (DE) Weapons. Approaches to improved compact energy storage for shipboard DE systems including novel super capacitors, batteries, power control systems, High Voltage (HV) power conditioning and interfaces to pulsed power drivers for DE weapons are needed to improve integration options for future DE weapons. Research methods to improve HV switch lifetimes, shelf life and reliability for switches on the order of 50-100 kiloVolts. Examine gas medium and housing materials for sealed switches with long shelf lives. Define experimental and modeling methods for estimating shelf life of sealed gas switches. Determine materials and designs of solid-state switches best suited for 50-100 kiloVolt operation at high pulse repetition rates. Define test stands and evaluation techniques for solid-state HV switches.
- **DD-05 – Autonomous Systems:** Research on intelligent architectures that combine and exploit some or all of the following techniques: AI-ML, reinforcement learning, probabilistic or expert systems capabilities. Such architectures will perform target assignment for cooperative combat of unmanned and manned warships; architectures must provide perform target assignment within the C2 system of manned or unmanned warships within the naval task force. Distributed systems such as sensors or weapons can be modeled as a time series of graphs consisting of nodes (sensors or weapons) and edges (information passed between the nodes). This viewpoint along with the associated mathematical formalisms allows one to better predict the behavior of these systems as they evolve in time. This work is also relevant to other types of networks, such as cyber networks in particular. Some of the techniques developed may have applications in other areas, such as video processing, where the data can be naturally represented in tensor form. We seek advancement in the state of the art in understanding verification, validation, accreditation and safety certification of autonomous systems. There is particular interest in those situations where these systems are under the control of algorithms based on artificial intelligence and/or machine learning. Explore components or functions of unmanned systems that can be fully automated while minimizing operator interaction. Consider all aspects of functionality that would allow for autonomous behavior and integration with Navy ship systems such as combat systems, weapons systems, sensors, and control stations. Consider functions such as navigation, situational awareness, targeting, sensors, environmental conditions (temp, wind, humidity, etc.), control, communications, etc. Identify and recommend prototype applications that will minimize operator-in-the loop functions and minimize response times for sharing critical information to support Naval operations.
- **DD-06:** Advanced Electromagnetic Systems: Successful naval vessel topside design is a highly complex task that is critical to fleet warfighting capability. Current approaches to communicating highly complex analysis results with stakeholders have shortfalls that lead to suboptimal designs. To bridge this gap, we request research into the effectiveness of assistive visualization technologies as a method for communicating complex electromagnetic phenomena that drive ship design decisions. Electronic Warfare (EW) systems have been collecting and processing signals of interest since the inception of wireless communication and radars. As signal processing and data collection technologies advance, EW sensors process an ever-increasing amount of data. We need novel approaches to detect, identify and track signals of interest. As EW systems are subject to intentional and unintentional interference, we seek research on innovative interference mitigation strategies. To this end, we are seeking new ways to integrate multiple data types to form an improved picture of the electromagnetic battlespace. This will require the combination of many data types (i.e. RF, Microwave, IR, Radar, LADAR, images, etc.) to form the improved picture of the battlespace and aid in decision making. Also, we are interested in expanding the signals collected in the HF to VHF (3-300 MHz) by researching compact and efficient antennas with a focus on technologies that would reduce the size, weight, and signature of those antennas.
- **DD-07 – System Safety:** System safety engineers spend a significant amount of time combing through documents to extract design features that can be hazardous to personnel, equipment and the environment and mitigations that address those and other

hazards. As with any task performed by humans, there is a risk of gaps due to inherent cognitive limitations of humans and the size and complexity of the information/data they have to assess. This project will investigate feasibility for and develop a prototype AI agent with basic capabilities to aid system safety engineers in this task.

- **IH-01:** Novel energetic materials and systems, formulations and applications to include predictive methods, energy storage, enhanced safety and reduced sensitivities in applications, processing characteristics and energy release for enhanced performance or lethality. Focus on higher energy density and innovative energy storage and release concepts that also reduce sensitivities.
- **IH-02:** Advanced manufacturing methods and processes for energetic and explosive ordnance disposal (EOD) applications to include but not limited to additive manufacturing of co-layered materials and sensitive materials and resonance mixing. Improve chemical processing and chemical formulation scale-up methods, tools, and processes for energetic materials and energetic material systems.
- **IH-03:** Improved EOD analytical tools and methods for remote detection/characterization of unexploded ordnance (UXO) and home-made explosives (HME) to render them safe.
- **IH-04:** Development and characterization of novel materials (i.e. sorbant, hydrophobic, oleophobic, and omniphobic surfaces or coatings) for interacting with contaminants of interest. Technologies in this area that facilitate the development of sensing, sequestering, identifying, repelling, self-cleaning or self-decontaminating material are of interest.
- **IH-05:** Mitigation technologies against toxins, bacteria, viruses and/or their respective stimulants/surrogates are of interest. Technologies may span all aspects of biodefense.
- **PD-01: Network Security:** NSWCPD is interested in novel techniques to improve the security and resilience of Supervisory Control and Data Acquisition (SCADA) networks using Software Defined Networks (SDN) technologies (i.e. Openflow, OpenDaylight). Interest is focused on utilizing novel SDN Northbound API applications to add authentication, encryption, and secure configuration to SCADA devices (PLC, VFD, HMI, etc.) with proprietary interfaces. The proposer should describe how they would develop flexible simulation environments, quantify impacts of SDN on network performance and control systems, and integrate physical devices with simulation environment. Technical work as well as a strong student participation on the project are desired.
- **PD-02: Modeling of Reactive Flow and Fire from Energy Storage Systems:** Future energy storage will employ lithium-ion batteries, which have the potential to release toxic, conductive and flammable/explosive mixtures of volatile electrolyte materials. These releases have multiple possible paths, including to be ejected via a case rupture at high speeds and ignite, release directly from a vent causing a fuel/air fire, or, seeping/leaking out and pooling in locations where they may increase to an explosive level. This effort will build reactive flow and fire modeling capability, with the understanding that not all proprietary details of cell design will be known. It will consider reactive flow in vent paths, flame impingement on surfaces, and flame fronts under marginally mixed environments in enclosed spaces, for a set of common battery electrolyte compositions. Technical work as well as a strong student participation on the project are desired.
- **PH-01:** Advanced computer vision methods and algorithms to verify the completion and accuracy of complex maintenance tasks. Extend current methodologies to automatically advance the application after action is complete. Identify complex objects via available/interoperable mobile computing platforms such as tablets and AR devices. Consider interoperability with other maintenance-related applications.
- **PH-02:** Research and development of radio frequency transparent “super hydrophobic” coatings to prevent ice formation on combat and communication systems in arctic and subarctic atmospheres. Consideration of the coating(s) to be applied on metallic and non-metallic (i.e. composite) structures and maintain effectiveness for representative deployment timeframes. Attention should be given to abrasion resistance, as ice formation on the surface will lead to accelerated wear behavior.
- **KP-01:** Serious Gaming applications for training and performance support, inclusive of research into visual, auditory, and tactile, Augmented, Mixed, Extended, and Virtual Reality technologies. Research may also include Instructional Systems Design and Human Factors considerations associated with serious gaming applications, and integration of those applications with DoD reference architectures such as the Assistant Secretary of Defense for Readiness (ASD(R)) sponsored Total Learning Architecture (TLA). Expand Unmanned Underwater Vehicles (UUV) capabilities through artificial intelligence (AI) to static undersea sensors and/or dynamic groups (unmanned vehicles) to improve autonomous perception. Include generation of world models, self-localization, and obtaining/processing information for autonomous planning and decision making.
- **NP-01:** Novel concepts in Digital Twin and Simulation Based Design (SBD) for navy related systems in order to interrogate/assess performance of complex physical builds in a virtual environment. Multi-tiered, multi-disciplinary approach to Modeling and Simulation (M&S) for undersea domain, from platform vs platform engagement modeling, hardware in the loop assessments, and physics-based modeling for new technology development and performance gap analysis.
- **NP02:** Exploring the full electromagnetic (EM) spectrum to develop advanced imaging and electronic capabilities (antenna design, high dynamic range imaging, microwave interferometry, and high-energy laser research). Provide a capability to continually monitor operations in an electromagnetically contested environment. Improve ability to detect and classify EM threats and improve ability to deny adversary EM mobility across the EM spectrum.
- **NP03:** Investigate R&D efforts that will influence the cyber resilience at all phases of undersea systems life cycle engineering including design, construction, deployment and execution. Provide a reliable and dedicated friendly network cyber operational picture that maps friendly cyber terrain and improves visibility of the current cyber security status. Develop robust cyber indications and warning capabilities to provide early warning of adversary cyber actions in order to detect and proactively counter

attempts to disrupt friendly command and control. Investigate the development of cybersecurity tools that are not reliant on signatures of prior attacks or known malicious code, but instead characterize normal network, system, and user behavior and respond to abnormal conditions autonomously.

- **NH-01:** The Naval Sea Systems Command (NAVSEA) monitoring program works to improve our understanding and better characterize impacts of NAVSEA testing on protected marine species. In particular, the program focuses on developing information on the *occurrence* of protected marine species, *exposure* of protected marine species to Navy activities, *response* of protected species to Navy activities, and *consequences* of responses to Navy activities. NAVSEA is especially interested in proposals focusing on certain priority areas (i.e., Gulf of Mexico, Pacific Northwest) and priority species (e.g., Gulf of Mexico Bryde's whale, Gulf of Mexico sperm whale, harbor seal, harbor porpoise, marbled murrelet, salmonids endemic to the Pacific Northwest, and green sturgeon). However, we will review all proposals that aim to monitor impacts of Navy testing on protected marine species

Link to Additional Information: Go to www.grants.gov and search for opportunity number: **N0017420001**

5. Office of Postsecondary Education (OPE): Fund for the Improvement of Postsecondary Education (FIPSE): Open Textbooks Pilot Program, Department of Education

Application Deadline: November 16, 2020

This grant competition is administered by the Office of Postsecondary Education at the U.S. Department of Education (the Department). The purpose of the OTP program is to support projects at eligible institutions of higher education (IHEs) that create new open textbooks and expand the use of open textbooks in courses that are part of a degree granting program, and particularly those with high enrollments. Applicants are encouraged to develop projects that demonstrate the greatest potential to achieve the highest level of savings for students through sustainable, expanded use of open textbooks in high-enrollment courses or in programs that prepare individuals for in-demand fields.

For information on the absolute priorities, competitive preference priority, invitational priority, selection criteria, and other program and competition details, refer to the *Federal Register* Notice Inviting Applications (NIA) and this application package. This application package contains the instructions and forms needed to submit a complete application for the OTP program. Applications for FY 2020 grants under the OTP program must be submitted electronically using Grants.gov at <http://www.grants.gov>. Applicants are required to follow the Common Instructions for Applicants to Department of Education Discretionary Grant Programs published in the *Federal Register* on February 13, 2019 (84 FR 3768) and available at www.govinfo.gov/content/pkg/FR-2019-02-13/pdf/2019-02206.pdf. This document contains requirements and information on how to submit an application.

The Department will only consider applications that meet all three absolute priorities. Applicants that do not meet the absolute priorities will not move forward for review. The Priorities are as follows:

- Absolute Priorities:
 - Absolute Priority 1: Improving Collaboration and Dissemination.
 - Absolute Priority 2: Addressing Gaps in the Open Textbook Marketplace and Bringing Solutions to Scale.
 - Absolute Priority 3: Promoting Degree Completion.
- Competitive Preference Priority:
 - Using Technology-Based Strategies for Personalized Learning and Continuous Improvement.

Link to Additional Information: <https://www.govinfo.gov/content/pkg/FR-2020-09-15/pdf/2020-20379.pdf> or www.grants.gov and search for opportunity **ED-GRANTS-091520-001**

6. Energy and Carbon Optimized Synthesis for the Bioeconomy (ECOSynBio), Department of Energy, Advanced Research Projects Agency Energy

Concept Paper Deadline: October 26, 2020

A robust and sustainable bioeconomy can only be realized through the industrial-scale, carbon-neutral synthesis of fuels, chemicals, and materials. The rapid deployment of renewable power is driving down the cost and carbon intensity of electricity which presents the opportunity for a tradeoff: by using more clean electricity to power novel bioconversion platforms, less CO₂ will be produced. This will be made possible by engineering new biorefining systems capable of using electrically derived external reducing equivalents to improve the efficiency of biomass conversion and CO₂ utilization. In addition, externally sourced CO₂ itself may be used as a feedstock, enabling additional carbon neutral and even carbon-negative products. Successful new platforms will serve to maximize the utility of carbon resource inputs, minimize associated land use requirements, and mitigate lifecycle GHGs simultaneously.

This funding opportunity seeks submissions to establish new technologies to significantly improve the carbon efficiency of bioconversion platforms through the accommodation of external reducing equivalents. Proposed systems of interest include, but are not limited to:

- (1) carbon optimized fermentation strains that avoid CO₂ evolution,
- (2) engineered mixotrophic consortia or systems that avoid CO₂ evolution,
- (3) biomass or gas fermentation with internal CO₂ utilization,
- (4) cell-free carbon optimized biocatalytic biomass conversion and/or CO₂ utilization, and
- (5) cross-cutting or other proposed carbon optimized bioconversion schemes.

All systems will need to demonstrate the capacity to accommodate external reducing equivalents to optimize the carbon efficiency of the system as compared to traditional fermentation systems (i.e. the sum of the recoverable energy contents of the products is greater than the energy content of the biomass or primary carbon feedstock).

In summary, based on the opportunities specified above, ARPA-E seeks submissions to establish fermentation strains and/or bioconversion systems and platforms capable of:

- (1) Accommodating necessary reducing equivalents in real-time
- (2) Enabling stoichiometric sugar splitting chemistries (system basis), enhanced carbon oxide utilization via gas fermentation, or cell-free biocatalytic biosynthesis without carbon loss, and
- (3) Generating fuels, fuel-relevant intermediates, or impactful chemicals at or above titers and production rates prescribed by a corresponding system-level and commercial scale techno-economic analysis (TEA), which:
 - a. Contain more embodied energy (specific energy (MJ/kg)) in the product than in the carbon feedstocks
 - b. Substantially decrease lifecycle GHG emissions for such products (as assessed by a corresponding life cycle analysis (LCA)), and
 - c. Are economically attractive at commercial scales (as assessed by a corresponding TEA).

Link to Additional Information: <https://arpa-e-foa.energy.gov/#FoaId05f5077d-caa1-467a-87f6-e82732d4595f>

7. Center for Early Lifestage Vulnerabilities to Environmental Stressors, Environmental Protection Agency

Application Deadline: November 12, 2020

The U.S. Environmental Protection Agency (EPA), as part of its Science to Achieve Results (STAR) program, is seeking applications to support a Center for Early Lifestage Vulnerabilities to Environmental Stressors. EPA is interested in supporting a transdisciplinary research center to better understand potential causal relationships among cumulative exposures to chemicals and non-chemical environmental stressors during early lifestages and modifying factors that result in adverse developmental health effects.

Developmental health outcomes may include attention deficit/hyperactivity disorder (ADHD), reduced IQ, obesity, lessened self-regulatory capacities, anxiety, depression, attention problems, lower memory function, or structural changes to the brain. The application should include the development and demonstration of novel and revolutionary quantitative methods and approaches to integrate multidisciplinary data (epidemiology, toxicology, exposure science, risk assessment, public health, social science, and environmental science).

The proposed research should be comprehensive and include specific vulnerabilities to chemicals, non-chemical environmental stressors, and modifying factors at selected early lifestages (including prenatal) for cumulative exposures as well as their linkage(s) to specific developmental health outcome(s) during early child development. Use of existing epidemiological data in conjunction with other public health, environmental, and social data to understand early life vulnerabilities to certain health outcomes with modifying factors is strongly recommended. There is a considerable amount of research data available from previous NIEHS/EPA Children's Environmental Health and Disease Prevention Research Centers (13, 22), Pediatric Environmental Health Specialty Units (PEHSU) (23), EPA's America's Children and the Environment (ACE) report (24), and other publicly available environmental health data, however, the data need to be used in innovative ways to obtain scientific answers to the research subtopics listed below.

The research area of interest focuses on early lifestage (prenatal, perinatal) vulnerabilities from exposures to environmental chemical stressors which will determine health during early childhood development.

Subtopics: The Center application must include two individual research projects which should include multidisciplinary teams involving appropriate expertise to address the selected research subtopics. There are seven subtopics identified below and at least two of them, in any combination, should be addressed in the research projects (e.g., one project may address one subtopic and the other

one may address one subtopic; or one project may address two subtopics and the other one may address one subtopic). The applicant should clearly describe in its individual Research Project Plan Descriptions (see Section IV.C.7) how it selected the subtopics and combined them in each research project to serve as integral components of the Center. Applications with less than two or more than two individual research project plan descriptions will be deemed ineligible (see Section III.C).

- Characterize cumulative prenatal and/or perinatal exposures to chemicals and potential consequential age-group-specific health effects.
- Identify and explain the relationship between perinatal environmental chemical exposures and adverse children’s health outcomes.
- Characterize the inter-relationships between chemical and non-chemical environmental stressors with respect to physiological responses, compensatory responses, and resultant health effects.
- Characterize the dynamic interactions between children’s developing biology, behavior, perinatal environmental chemical exposures, and outcomes.
- Identify the highest priority non-chemical environmental stressors and exposures to chemicals for women prior to and/or during pregnancy and how those exposures may impact cumulative risk for adverse birth outcomes (e.g., live births, full-term births, low birth weight, teratology).
- Characterize and explain how changes in chemical exposures under an extreme event such as a pandemic or natural disaster may impact prenatal and early children’s health.
- Identify and explain the relationship between perinatal environmental chemical exposures and other factors (socio, cultural, and environmental) that would impact risk assessment.

Link to Additional Information: <http://www.epa.gov/research-grants/center-early-lifestage-vulnerabilities-environmental-stressors>

8. Agriculture and Food Research Initiative - Foundational and Applied Science, Department of Agriculture, National Institute of Food and Agriculture

Application Deadline: Varies depending on programmatic area

The Agriculture and Food Research Initiative (AFRI) is America’s flagship competitive grants program that provides funding for fundamental and applied research, education, and extension projects in the food and agricultural sciences. In this RFA, NIFA requests applications for six AFRI priority areas through the Foundational and Applied Science Program for 2021 and 2022. Applicants considering applying to the second year should check the AFRI RFA webpage and www.grants.gov. The goal of this program is to invest in agricultural production research, education, and extension projects for more sustainable, productive and economically viable plant and animal production systems. The global agricultural output needs to be expanded significantly to meet the food needs of the population expected in 2050; thus, it is imperative to develop innovative, safe and sustainable management strategies for livestock, crops, and critical underlying resources.

In 2021 and 2022, applications are sought in the following priority areas:

- 1) Plant health and production and plant products;
- 2) Animal health and production and animal products;
- 3) Food safety, nutrition, and health;
- 4) Bioenergy, natural resources, and environment;
- 5) Agriculture systems and technology; and
- 6) Agriculture economics and rural communities

The anticipated amount available for new grants for the 2021 deadlines in this Foundational and Applied Science RFA is approximately \$290 million. The anticipated amount available for new grants for the 2022 deadlines in this Foundational and Applied Science RFA is approximately \$290 million.

This RFA solicits Standard Grants, Conference Grants, Coordinated Agricultural Project Grants, and Food and Agricultural Science Enhancement (FASE) Grants, whereas project types solicited in this RFA are Research, Extension and Integrated Research, Education and/or Extension projects. Grant types and project types solicited vary by program area priority and not all grant types are solicited within each program area priority. See Part I, C (Program Area Descriptions) of this RFA for grant and project types solicited by each specific program area priority, and Part II, C of this RFA for a description of each individual grant type and project type.

The purpose of AFRI is to support research, education, and extension work by awarding grants to solve key problems of local, regional, national, and global importance in sustaining conventional, organic, and urban agricultural systems. These include farm efficiency, profitability and sustainability; ranching; bioenergy; forestry; aquaculture; rural communities and entrepreneurship; human nutrition; mitigating impacts of biotic and abiotic constraints on food production; food safety; mitigating food waste and food loss;

physical and social sciences; home economics and rural human ecology; biotechnology; and classical breeding. Through this support, AFRI advances knowledge in both fundamental and applied sciences important to agriculture. Funding this work also allows AFRI to support education and extension activities that deliver science-based knowledge to end users, allowing them to make informed, practical decisions. This AFRI RFA provides funding for research-only, extension-only, and integrated research, education, and/or extension projects addressing the six priorities identified in Part I, A.

Food and agricultural systems are under the constraints of a growing population; pressure on natural resources; challenges of climate variability and change; and complex demands of ensuring nutritional security and food safety in a global economy. Addressing these challenges requires research, education, extension, and integrated programs in concert with agroecological approaches that increase agricultural and natural resource sustainability. The term "sustainable agriculture" (7 U.S.C. 3103) means a combined system of plant and animal production practice having a site-specific application that will, over the long-term, achieve the following goals:

- 1) satisfy human food and fiber needs;
- 2) enhance environmental quality and the natural resource base upon which the agricultural economy depends;
- 3) make the most efficient use of nonrenewable resources and on-farm resources and integrate, where appropriate, natural biological cycles and controls;
- 4) sustain the economic viability of farm operations; and
- 5) enhance the quality of life for farmers and society as a whole. AFRI encourages projects addressing enhancement of sustainability of agricultural systems.

Link to Additional Information: <https://nifa.usda.gov/funding-opportunity/agriculture-and-food-research-initiative-foundational-applied-science-program>

9. Pediatric and Reproductive Environmental Health Scholars (PREHS): Strengthening the Pipeline, Department of Health and Human Services, National Institutes of Health

Application Deadline: January 15, 2021

The goal of the Pediatric and Reproductive Environmental Health Scholars (PREHS) program is to create of a strong network of healthcare professionals who possess the skills and knowledge to address the complexities of pediatric and reproductive environmental health. The PREHS program is envisioned as a strategy to bridge clinical training with a career in environmental health research relevant to pediatrics and reproductive health. As such, the PREHS program will provide training in clinical practice in environmental health, community-level advocacy, and teaching to pediatric healthcare providers, obstetricians/gynecologists, nurses, and other interested healthcare professionals, to be known as PREH Scholars. These K12 grant awards will generate well-qualified pediatric and reproductive environmental health leaders.

The purpose of this FOA is to provide new healthcare professionals with state-of-the-art environmental health training that blends academic research and practice-based applications in real-world settings. The program will provide supervised research career development opportunities to assist junior faculty. The goal of the Pediatric and Reproductive Environmental Health Scholars (PREHS) program is to create of a strong network of healthcare professionals who possess the skills and knowledge to address the complexities of pediatric and reproductive environmental health.

Background and Objectives

The NIEHS, the Agency for Toxic Substances and Disease Registry at the Centers for Disease Control and Prevention (ATSDR/CDC) and the Environmental Protection Agency (EPA) have a long history of working together on children's environmental health. Through regular program interactions and discussions, the Pediatric and Reproductive Environmental Health Scholars (PREHS) program was identified as a new, collaborative opportunity to bring together shared interests in children's environmental health and the advancement of the Pediatric Environmental Health Specialty Unit (PEHSU) program, which is a jointly supported program between CDC/ATSDR and the EPA. The agencies see the PREHS as a program for scholars to acquire advanced content in pediatric and reproductive environmental health, and gain an understanding of the many interactions – biological, psychological, social and cultural – that occur between children, pregnant women, and new mothers and their environment. With this newly acquired knowledge, scholars will be better equipped to assess and manage pediatric health conditions related to exposures in the child's environment.

The PREHS program will bring together environmental health science research expertise at academic institutions with clinical and translational expertise at Pediatric Environmental Health Specialty Units (PEHSUs) to provide pediatric healthcare providers, obstetricians/gynecologists, nurses, and other interested healthcare professionals (PREHS Scholars) with research experiences that bridge clinical practice in environmental health, community-level engagement, and teaching. These K12 grant awards will generate well-qualified pediatric and reproductive environmental health leaders.

Applications for this award must propose a comprehensive career development and research plan that: (1) has environmental health research relevant to pediatrics and reproductive health and is within the mission of the NIEHS, (2) serves as a mechanism for gaining research competencies in environmental medicine related to pediatrics and reproductive health to advance scholars' medical knowledge, patient care, interpersonal and communication skills, professionalism, and systems-based practice, and (3) provides scholars with the necessary environmental public health and clinical expertise to advance their careers as academic researchers and physician scientists, such as improving scientific and grant writing skills, developing effective advocacy skills, and fostering expertise in risk assessment and risk communication.

Programs should include both didactic components and supervised research experiences designed to accommodate research candidates with varying levels of experience and at various stages of their career. For example, a scholar with limited experience in environmental health may find it appropriate to engage in a structured, phased developmental program, including a designated period of didactic training followed by a period of supervised research experience. While scholars will likely have limited research experiences, they are expected to be prepared to apply for independent research funding by the completion of the program.

Program Considerations

This FOA encourages applications from organizations that propose creative and innovative institutional research career development programs in the mission area(s) of the NIEHS. The proposed institutional research career development program may complement other, ongoing research training and career development programs at the applicant institution, but the proposed career development experiences must be distinct from those career development programs currently receiving Federal support.

This Funding Opportunity Announcement (FOA) does not allow appointed scholars to lead an independent clinical trial but does allow them to obtain research experience in a clinical trial led by a mentor or co-mentor. NIH strongly supports training towards a career in clinically relevant research and so gaining experience in clinical trials under the guidance of a mentor or co-mentor is encouraged.

Link to Additional Information: <https://grants.nih.gov/grants/guide/rfa-files/RFA-ES-20-007.html>

10. Climate Program Office FY2021, Department of Commerce, NOAA

Application Deadline: October 19, 2020 (for AC4 only) and November 30, 2020 (other five priorities included in RFA)

Climate variability and change present society with significant economic, health, safety, and security challenges. As part of the National Oceanic and Atmospheric Administration (NOAA) climate portfolio within the Office of Oceanic and Atmospheric Research (OAR), the Climate Program Office (CPO) addresses these climate challenges by managing competitive research programs through which high-priority climate science, assessments, decision support research, outreach, education, and capacity-building activities are funded to advance our understanding of the Earth's climate system, and to foster the application and use of this knowledge to improve the resilience of our Nation and its partners. Through this announcement, CPO is seeking **applications for 6 individual competitions in FY21**. Several of these competitions are relevant to high-priority climate risk areas CPO is organizing some of its activities around to improve science understanding and/or capabilities that result in user-driven outcomes in four initial risk areas: Coastal Inundation, Marine Ecosystems, Water Resources and Extreme Heat

<https://cpo.noaa.gov/News/ArtMID/7875/ArticleID/1945/NOAA%E2%80%99s-Climate-Program-Office-launches-Climate-Risk-Areas-Initiative>.

The 6 competitions covered by this announcement are as follows:

- AC4: Emissions, Air Quality, and Heat in Urban Areas
- AC4 and COM: Atmospheric impacts due to changes in anthropogenic activity during the COVID-19 pandemic
- MAPP: New Climate Monitoring Approaches and Products for Areas of Climate Risk
- MAPP: Process-Oriented Diagnostics for NOAA Climate Model Improvement and Applications
- COM and CVP: Innovative Ocean Dataset/Product Analysis and Development for support of the NOAA Observing and Climate Modeling Communities
- Adaptation Sciences (AdSci) Program: Advancing Climate Adaptation and Coastal Community Resilience

NOAA, OAR, and CPO encourage applicants and awardees to support the principles of diversity and inclusion when writing their proposals and performing their work. Diversity is defined as a collection of individual attributes that together help organizations achieve objectives. Inclusion is defined as a culture that connects each employee to the organization. Promoting diversity and inclusion improves creativity, productivity, and the vitality of the climate research community in which CPO engages.

In FY21, approximately \$10 million will be available for approximately 90 new awards pending budget appropriations (see section I.B above). It is anticipated that most awards will be at a funding level between \$50,000 and \$300,000 per year with exceptions for larger

awards, unless otherwise noted below. Federal funding for FY 2022 may be used to fund awards submitted under this Notice of Funding Opportunity. Current or previous grantees are eligible to apply for a new award that builds on, but does not replicate, activities covered in existing or previous awards. Current grantees should not apply for supplementary funding through this announcement.

1. AC4 - Emissions, Air Quality, and Heat in Urban Areas. Proposals should not exceed \$200,000 per year. It is anticipated that \$1 million will be available for the first year of the funded projects.
2. AC4 and COM - Atmospheric impacts due to changes in anthropogenic activity during the COVID-19 pandemic. Proposals should not exceed \$200,000 per year. It is anticipated that \$1 million will be available for the first year of the funded projects.
3. MAPP - New Climate Monitoring Approaches and Products for Areas of Climate Risk. Proposals should not exceed \$150,000 per year. It is anticipated that \$1.5 million will be available for the first year of funded projects.
4. MAPP - Process-Oriented Diagnostics for NOAA Climate Model Improvement and Applications. Proposals should not exceed \$180,000 per year for each type I project, or \$750,000 for a type II project. It is anticipated that \$2.0 million will be available for the first year of funded projects.
5. COM and CVP - Depending on the availability of funds and quality of proposals, COM (with contributions from CVP and GOMO) will seek to fund 2 and/or three-year projects in FY21. Proposals should not exceed \$150,000 per year, or \$450,000 total. It is anticipated that \$1.2 million will be available for the first year of funded projects.
6. AdSci - Depending on the availability of funds and the quality of proposals, AdSci will seek to fund a combination of 1- and 2-year projects in FY 21. Proposals should not exceed \$300,000 total. It is anticipated that \$3 million will be available for the first year of funded projects.

Link to Additional Information: Go to www.grants.gov and search for opportunity **NOAA-OAR-CPO-2021-2006389**

11. Computer and Information Science and Engineering (CISE): Core Programs, National Science Foundation

Application Deadline: November 12, 2020

The mission of the Directorate for Computer and Information Science and Engineering (CISE) is to enable the U.S. to uphold its leadership in computing, communications, and information science and engineering; promote understanding of the principles and uses of advanced computing, communications, and information systems in service to society; support advanced cyberinfrastructure that enables and accelerates discovery and innovation across all science and engineering disciplines; and contribute to universal, transparent, and affordable participation in an information-based society.

To achieve this mission, CISE supports investigator-initiated research and education in all areas of computer and information science and engineering, fosters broad interdisciplinary collaboration, helps develop and maintain cutting-edge national cyberinfrastructure for research and education, and contributes to the development of a computer and information technology workforce with skills necessary for success in the increasingly competitive global market. The NSF CISE Directorate supports research and education projects that develop new knowledge in all aspects of computing, communications, and information science and engineering, as well as advanced cyberinfrastructure, through the following core programs (access corresponding link for details of the research areas of interest in each specific program):

Division of Computing and Communication Foundations (CCF):

- Algorithmic Foundations (AF) program at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf20591
- Communications and Information Foundations (CIF) program at https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503300
- Foundations of Emerging Technologies (FET) program at https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505589; and
- Software and Hardware Foundations (SHF) program at https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503301.

Division of Computer and Network Systems (CNS):

- CNS Core (CNS Core) program at https://nsf.gov/funding/pgm_summ.jsp?pims_id=505671.

Division of Information and Intelligent Systems (IIS):

- Human-Centered Computing (HCC) program (formerly the Cyber-Human Systems [CHS] program) at https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504958;
- Information Integration and Informatics (III) program at https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503303; and

- Robust Intelligence (RI) program at https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503305.

Office of Advanced Cyberinfrastructure (OAC):

- OAC Core Research (OAC Core) program at https://nsf.gov/funding/pgm_summ.jsp?pims_id=505670.

Proposers are invited to submit proposals in several project classes, which are defined as follows:

- Small Projects -- up to \$500,000 total budget with durations up to three years: projects in this class may be submitted to CCF, CNS, and IIS;
- Medium Projects -- \$500,001 to \$1,200,000 total budget with durations up to four years: projects in this class may be submitted to CCF, CNS, and IIS only; and
- OAC Core Projects -- up to \$500,000 total budget with durations up to three years: projects in this class may be submitted to OAC only.

Links to Additional Information: <https://www.nsf.gov/dir/index.jsp?org=CISE> and http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf20591

12. FAA Aviation Research Grants Program, Department of Transportation, FAA Aviation Research Grants

Application Deadlines: 4 times a year, closing in 2027

The FAA hereby announces its continuing interest in receiving applications for aviation research grants and cooperative agreements to pursue the long-term growth and short-term technical needs of civil aviation, under this funding opportunity. Eligibility of applicants for the award of an aviation research grant varies depending on the nature of the proposer's organization, as well as the character of the research being proposed. In general, colleges, universities, and other non-profit research institutions under Section 501(c)(3) of Title 26 of United States Code, are eligible to apply for an aviation research grant.

The FAA Aviation Research Grants Program encourages and supports innovative, advanced research of potential benefit to the long-term growth of civil aviation and commercial space transportation. The pursuit of basic and applied research in scientific and engineering disciplines that have the potential to further knowledge and understanding on a broad front of emerging technologies is crucial to the realization of this goal. The intent is to encourage applied research and development to enhance technology assimilation, transfer, and development in the FAA. The FAA Aviation Research Grants Program does not require the immediate application to Research and Development (R&D) programs, although this may occur in some cases. The FAA encourages the submission of proposals that embrace the entire spectrum of physical, chemical, biological, medical, psychological, mathematical, and engineering sciences.

The following list illustrates topics of interest to those who may consider applying for a grant under this funding opportunity:

1. Capacity and Air Traffic Control Technology
2. Communications, Navigation, and Surveillance
3. Aviation Weather
4. Airports
5. Aircraft Safety Technology
6. Human Factors and Aviation Medicine
7. Systems Science/Operations Research
8. Unmanned Aircraft System (UAS) Unmanned Traffic Management (UTM), Class E Upper Airspace Traffic Management (ETM), and Urban Air Mobility (UAM)

For more information, please carefully review FAA Notice of Funding Opportunity 20-01, and any supporting attachments.

Since various FAA R&D Program Managers (i.e., Aging Aircraft, Aviation Medicine, etc.) will review the proposal, and provide funds for award from their project accounts, it is in the interest of the proposer to make contact with the appropriate program manager in order to come to an understanding regarding the needed research. Applicants are strongly encouraged to participate in a two-way communication to define research goals and objectives, and the description of work. This can only enhance the likelihood of securing sponsorship, improve the probability of project success, and is strongly encouraged on the part of applicants.

Link to Additional Information: Go to www.grants.gov and search for funding opportunity **20-01** under Department of Transportation, FAA

13. FY21 Neotropical Migratory Bird Conservation Act Grants, Department of the Interior, Fish and Wildlife Service

Application Deadline: November 5, 2020

The United States Neotropical Migratory Bird Conservation Act (NMBCA) established an annual, competitive grants program to support projects that promote the conservation of neotropical migratory birds and their habitats in the United States, Canada, Latin America and the Caribbean. The U.S. Fish and Wildlife Service's Division of Bird Habitat Conservation (DBHC) is responsible for managing the NMBCA grants program and administers all grants. Applicants submit project proposals, using Grants.gov, to the DBHC during the program's one funding cycle per year. The FWS Director selects the projects for funding. This program supports the DOI and FWS mission of protecting and managing the nation's natural resources by collaborating with partners and stakeholders to conserve land and water and to expand outdoor recreation and access.

In 2000, recognizing the significant threats Neotropical migratory birds face in their annual migrations between the United States (U.S.) and Latin America and the Caribbean, the U.S. Congress enacted the Neotropical Migratory Bird Conservation Act (NMBCA). The Neotropical Migratory Bird Conservation Act grant program solicits project proposals for the conservation of Neotropical migratory birds throughout their range. The purpose of the NMBCA is (1) to perpetuate healthy populations of neotropical migratory birds; (2) to assist in the conservation of neotropical migratory birds by supporting conservation initiatives in the United States, Canada, Latin America, and the Caribbean; and (3) to provide financial resources and to foster international cooperation for those initiatives. As clarified in the Act, "conservation" means the use of methods and procedures necessary to bring a species of neotropical migratory bird to the point at which there are sufficient populations in the wild to ensure the long-term viability of the species, including:

- (A) protection and management of neotropical migratory bird populations;
- (B) maintenance, management, protection, and restoration of neotropical migratory bird habitat;
- (C) research and monitoring;
- (D) law enforcement; and
- (E) community outreach and education.

Project proposals must (1) demonstrate that the project will enhance the conservation of neotropical migratory bird species in the United States, Canada, Latin America, or the Caribbean; (2) include mechanisms to ensure adequate local public participation in project development and implementation; (3) contain assurances that the project will be implemented in consultation with relevant wildlife management authorities and other appropriate government officials with jurisdiction over the resources addressed by the project; (4) demonstrate sensitivity to local historic and cultural resources and comply with applicable laws; and (5) describe how the project will promote sustainable, effective, long-term programs to conserve neotropical migratory birds (NMBs).

Link to Additional Information: Go to www.grants.gov and search for funding opportunity **F21AS00158**

14. Computational Approaches to Curation at Scale for Biomedical Research Assets, Department of Health and Human Services, National Institutes of Health

Application Deadlines: Standard R01 deadline dates at <https://grants.nih.gov/grants/how-to-apply-application-guide/dues-dates-and-submission-policies/dues-dates.htm>

NLM wishes to accelerate the availability of and access to secure, complete data sets and computational models that can serve as the basis of transformative biomedical discoveries by improving the speed and scope of the curation processes.

Digital curation involves characterizing, annotating, managing, and preserving digital assets such as research data sets, computational and other types of models, reusable visualization tools, and other digital assets. Proficient curation of digital assets maximizes their reuse potential, mitigates risk of obsolescence, reduces the likelihood that their long-term value will diminish or be lost, and helps assure reproducibility of research. The evolving digital ecosystem supports data-driven biomedical discovery by providing access to large quantities of biomedical and health-related data, to computational models and to open source software and code. The scope, scale and heterogeneity of digital data alone are vast, ranging from genome sequences to biomedical images, from observational health findings to environmental measurements, from family histories to sensor readings from personal trackers. As the amount and complexity of digital assets continue to grow, manual curation will not scale to meet future needs. At the same time, as researchers make research data sets, models and other tools available for new uses or re-analysis, it is important to minimize duplication and simplify the process of finding, managing, visualizing and mining all types of digital assets. To help researchers who want to find, interoperate and use these data sources to make new discoveries, and to share their findings so others can build upon them, the purpose of this funding announcement is to encourage applications for new approaches that (1) increase the speed and assure quality and security of storage techniques, retrieval strategies, annotation methods, data standards, visualization tools and other advanced data

management approaches and (2) improve our ability to make biomedical data and other digital research assets findable, accessible, interoperable and reusable (FAIR).

Research Objectives

Today's curation processes are a mix of computational and manual activities, involving specialized technical and professional staff. Public and private data repositories exist, and open source tools are widely available via GitHub and similar sites. Successful examples of semi-automated digital curation exist, employing processes that require varying degrees of human intervention to annotate the digital asset. However, to achieve FAIR access to huge collections of biomedical digital data assets, new or improved approaches for automated curation and management of digital assets must be designed, tested, validated, and widely adopted. An important component of this approach involves beginning the process of curation early in the data life cycle, ideally before the collection of new research data begins.

Generation and curation of biomedical data sets often involve a mix of people at different steps, including scientists at all career levels, technical support staff, IT specialists, annotators, and librarians. Approaches are needed that can be used by this decentralized and heterogeneous workforce to help them monitor and assess the accuracy, completeness, quality and efficiency of the automated curation of local digital assets, and of assets housed at other locations. Proposed approaches should identify the type of asset, intended user and expected improvements to be achieved over present curation and management of the asset.

Applications may propose development of new computational methods, or extend existing open-source tools and pipelines in order to enhance automation, improve efficiency, quality and security, and control costs. The improvements over comparable existing management or curation approaches must be documented. During the project period, applicants are expected to test the approach with one or more groups of targeted users. Approaches should be applicable to more than one subject domain. All awardees are expected to disseminate widely the results of their research including software.

Potential topics to be addressed include but are not limited to:

- Fully automated curation that meets community-defined standards for metadata
- Automated approaches to integration of disparate or heterogeneous data sets that map components to common data elements
- Automated annotation via extraction from text or other digital sources, linking the extracted information to a data set or other digital asset
- Automated quality control approaches that increase the completeness, accuracy or quality of a data set or model
- Automated research pipeline that begins at data capture or model development and is self-documenting

Link to Additional Information: <http://grants.nih.gov/grants/guide/pa-files/PAR-20-304.html>

15. Topology, National Science Foundation

Application Deadline: November 3, 2020

The Topology Program supports research on algebraic topology, including homotopy theory, ordinary and extraordinary homology and cohomology, cobordism theory, and K-theory; topological manifolds and cell complexes, fiberings, knots, and links; differential topology and actions of groups of transformations; geometric group theory; and general topology and continua theory. Conferences Principal Investigators should carefully read the program solicitation "Conferences and Workshops in the Mathematical Sciences" (link below) to obtain important information regarding the substance of proposals for conferences, workshops, summer/winter schools, and similar activities. For conference proposals with budgets not exceeding \$50,000, which in accordance with NSF policy can be reviewed internally at NSF, the following target dates are in effect: For an event that will start on a date prior to October 1 during a given calendar year, the proposal should be submitted in September of the previous year. For an event that will start in the period October 1 through December 31 of a given year, the proposal should be submitted in April of the same year. A conference proposal with a budget request exceeding \$50,000 should be submitted at least eight months before the event is scheduled to take place, in order to allow time for external review. For fiscal year 2021, the September due date for conference proposals is waived in view of the current pandemic. Please submit conference proposals for in-person meetings with budget requests not exceeding \$50,000 at least four months in advance of the conference dates. No decisions will be made on proposals to support in-person conferences until it is established whether any pandemic-related travel restrictions for the conference site and time frame will be in place.

Link to Additional Information: http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5551

16. CISE Community Research Infrastructure, National Science Foundation

Application Deadline: Letter of Intent (required) – December 15, 2020; Full Proposal – January 28, 2021

The Computer and Information Science and Engineering (CISE) Community Research Infrastructure (CCRI) program drives discovery and learning in the core CISE disciplines of the three participating divisions [(Computing and Communication Foundations (CCF), Computer and Network Systems (CNS), and Information and Intelligent Systems (IIS)] by funding the creation and enhancement of world-class research infrastructure. This research infrastructure will specifically support diverse communities of CISE researchers pursuing focused research agendas in computer and information science and engineering. This support involves developing the accompanying user services and engagement needed to attract, nurture, and grow a robust research community that is actively involved in determining directions for the infrastructure as well as management of the infrastructure. This should lead to infrastructure that can be sustained through community involvement and community leadership, and that will enable advances not possible with existing research infrastructure. Further, through the CCRI program, CISE seeks to ensure that researchers from a diverse range of institutions of higher education (IHEs), including minority-serving and predominantly undergraduate institutions, as well as researchers from non-profit, non-academic organizations, have access to such infrastructure. The CCRI program supports three classes of awards:

- Planning Community Infrastructure (Planning) awards support planning efforts to engage research communities to develop new CISE community research infrastructures (Planning).
- Medium Community Infrastructure (Medium) awards support the creation of new CISE community research infrastructure or the enhancement of existing CISE community research infrastructures with integrated tools, resources, user services, and research community outreach to enable innovative CISE research opportunities to advance the frontiers of the CISE core research areas. The Medium award class includes New (New) and Enhance/Sustain (ENS) awards.
- Grand Community Infrastructure (Grand) awards support projects involving significant efforts to develop new CISE community research infrastructures or to enhance and sustain an existing CISE community research infrastructure to enable world-class CISE research opportunities for broad-based communities of CISE researchers that extend well beyond the awardee organization(s).

Each CCRI Medium or Grand award may include support for operation of the infrastructure, ensuring that the awardee organization(s) is (are) well positioned to provide a high quality of service to CISE community researchers expected to use the infrastructure to realize their research goals.

CCRI community awards provide infrastructure, tools, resources and user services to the associated research community. This could include equipment, testbeds, software, and data repositories needed to test the limits of computing systems. The team managing the infrastructure is expected to provide user services and support, as well as community outreach and active engagement to evaluate the resources to determine the future needs for enhancements and to plan for sustainability.

CCRI computing infrastructure resources are expected to enable unique and compelling research opportunities otherwise inaccessible to the wider CISE research community.

Link to Additional Information: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf20610

17. Collaborative Research in Computational Neuroscience, National Science Foundation

Application Deadline: December 10, 2020

Computational neuroscience provides a theoretical foundation and a rich set of technical approaches for understanding complex neurobiological systems, building on the theory, methods, and findings of computer science, neuroscience, and numerous other disciplines. Through the CRCNS program, the U.S. National Science Foundation (NSF), National Institutes of Health (NIH), and Department of Energy (DOE); the German Federal Ministry of Education and Research (*Bundesministerium für Bildung und Forschung*, BMBF); the French National Research Agency (*Agence Nationale de la Recherche*, ANR); the United States-Israel Binational Science Foundation (BSF); Japan's National Institute of Information and Communications Technology (NICT); and Spain's State Research Agency (*Agencia Estatal de Investigación*, AEI) and National Institute of Health Carlos III (*Instituto de Salud Carlos III*, ISCIII) support collaborative activities that will advance the understanding of nervous system structure and function, mechanisms underlying nervous system disorders, and computational strategies used by the nervous system.

Two classes of proposals will be considered in response to this solicitation: Research Proposals describing collaborative research projects, and Data Sharing Proposals to enable sharing of data and other resources. Domestic and international projects will be considered. As detailed in the solicitation, international components of collaborative projects may be funded in parallel by the participating agencies. Specific CRCNS opportunities for parallel funding are available for bilateral US-German Research Proposals,

US-German Data Sharing Proposals, US-French Research Proposals, US-French Data Sharing Proposals, US-Israeli Research Proposals, US-Israeli Data Sharing Proposals, US-Japanese Research Proposals, US-Japanese Data Sharing Proposals, US-Spanish Research Proposals, US-Spanish Data Sharing Proposals, and multilateral proposals involving the United States and two or more CRCNS partner countries (see Section VIII of the solicitation for country-specific limitations).

Collaborating PIs from outside of the United States are referred to Section VIII of the solicitation for further instructions about applying to the appropriate partner funding agency. Appropriate scientific areas of investigations may be related to the interests of any of the participating funding organizations. Questions concerning a particular project's focus, direction, and relevance to a participating funding organization should be addressed to the appropriate person in the list of agency contacts found in Section VIII of the solicitation. NSF will coordinate and manage the review of proposals jointly with participating domestic and foreign funding organizations, through a joint panel review process used by all participating funders. Additional information is available in Section VI of the solicitation. Community-driven efforts such as workshops or synthesis papers are also encouraged, to map out new frontiers at the interface of neuroscience and other disciplines that could reshape brain research and its applications.

Link to Additional Information: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf20609

18. Foundation for a Smoke-free World Issues RFP for Research at Nexus of COVID-19, Smoking

Application Deadline: December 15, 2020

The Foundation for a Smoke-free World seeks to conduct research at the nexus of COVID-19, smoking, and nicotine that requires significant collaboration and research involving outside experts and organizations. Selected organization(s) will be expected to implement a range of projects relevant to the global pandemic, including well-designed and comprehensive pre-clinical, clinical, and epidemiological studies, to better understand the associations between smoking and/or nicotine use, and COVID-19 infection and outcomes.

The spread of COVID-19 has demanded that governments around the world take unprecedented steps to protect their citizens. This has meant restricting the movement of hundreds of millions of people around the world in an effort to limit the transmission of the disease. The situation has created unique challenges for people who are dependent on nicotine, including smokers, nicotine replacement therapy users, and users of alternative nicotine delivery products. There is emerging evidence that both nicotine use and smoking status may have an impact on COVID-19 infection rates and hospitalizations, as well as disease severity and mortality.

The underrepresentation of smokers in the available COVID-19 patient data and potential selection and measurement biases within existing research outputs requires well-designed epidemiological studies in order to obtain clarity about the true nature and impact of the relationship(s) between COVID-19 and smoking and/or nicotine use. To address current knowledge gaps, this RFP seeks to accelerate research in the following areas: the impacts of tobacco and nicotine products on COVID-19 outcomes; opportunities for interventions aimed at preventing or reducing COVID-19 infection, hospitalization, and disease progression; and/or interventions aimed at promoting healthier lifestyles (including but not restricted to nicotine use) in the wake of the pandemic.

To maximize the chances of getting results fast, the foundation seeks to undertake work in settings with sufficient COVID-19 cases and where smoking/nicotine use rates are in excess of 25 percent of the population for men or women. (The foundation will consider regions in which there are existing cohorts of smokers under observation for other reasons and where adding the above research plans are possible.)

Grants of up to \$150,000 for scoping/pre-clinical studies, up to \$250,000 for epidemiological studies, and up to \$500,000 for clinical studies will be awarded. Recommended duration of the grant funding is up to three months for scoping/pre-clinical studies, three to six months for epidemiological studies, and up to twelve months for clinical studies.

The foundation encourages participation by groups whose work aligns with the foundation's mission to eliminate smoking within a generation. These groups include institutions of higher education, nonprofits, commercial enterprises, governmental agencies, or other research-based organizations. Applicants should have a proven track record suitable for the area of research proposed. Previous research of tobacco and/or nicotine is appreciated but is not a requirement for funding. Successful applicants will likely have an interdisciplinary group of key personnel who can approach this project from their individual fields of expertise (e.g. epidemiologists, clinicians, behavioral economists, basic scientists, and public health specialists). The foundation expects successful applicants to conduct research and publish findings according to Open Science principles, including: declaring hypotheses and proposed analyses up front; making raw data available for analysis; publishing all results, whether positive or negative; and publishing in journals that offer open access.

Applicants should be aware that the foundation's Initial funding came from Phillip Morris International (PMI). The foundation has nonprofit status under section 501(c)(3) of the Internal Revenue Code and by law and policy must operate independently from PMI.

All interested parties should submit a detailed proposal for work to the foundation using its online application system. There is no page requirement for submissions, however the application form has links to three templates that must be fully completed for an application to be considered. Applicants will also have the option to upload additional relevant documentation.

The application portal will close at 6:00 p.m. EST on December 15, 2020. In order to capture studies that address various timeframes during the COVID-19 pandemic cycle, the foundation will review and evaluate submitted proposals monthly until closing. For additional, and FAQ, and a link to the online portal, see the Foundation for a Smoke-free World website.

Link to Additional Information: https://www.smokefreeworld.org/wp-content/uploads/2020/06/RFP-COVID-19_Smoking_Nicotine-Research-1.pdf

19. Superfund Hazardous Substance Research and Training Program, Department of Health and Human Services, National Institutes of Health

Application Deadline: February 15, 2020

The National Institute of Environmental Health Sciences (NIEHS) invites qualified investigators from domestic institutions of higher education to submit an application for a Superfund Research Program (SRP) Center grant. SRP legislation, under the Superfund Amendments and Reauthorization Act (SARA) of 1986, allows NIEHS the flexibility to create university-based Centers to conduct scientific research to address the wide array of scientific uncertainties facing the national Superfund program. The complex problems related to sites impacted by hazardous substances require the expertise of multiple biomedical and environmental science and engineering disciplines. Applicants responding to this Funding Opportunity Announcement are expected to design a research Center that integrates biomedical research (e.g., toxicology, epidemiology, mechanistic studies) with environmental science and engineering (e.g., remediation, geochemical, ecological sciences).

Responsiveness to Mandates: SARA Section 311(a) "Hazardous Substances Research and Training," authorizes NIEHS to create a basic research and training program for the development of:

- (1) advanced techniques for the detection, assessment, and evaluation of the effect of hazardous substances on human health;
- (2) methods to assess the risks to human health presented by hazardous substances;
- (3) methods and technologies to detect hazardous substances in the environment; and
- (4) basic biological, chemical, and physical methods to reduce the amount and toxicity of hazardous substances.

Centers are expected to assemble interdisciplinary research teams with expertise in biomedical science as well as environmental science and engineering to advance knowledge using innovative and integrated approaches. The SRP's fourth mandate reinforces the program's problem-solving mission; whereby, the research generated by SRP Centers would lead to strategies to prevent exposure and/or develop intervention strategies to improve public health. Centers are expected to facilitate transfer of research findings through coordinated data management and analysis; engage communities with prevention/intervention strategies; share findings to broader audiences; and train the future generation of scientists.

Problem-based, Solution-oriented Research Theme: As an integrated research program, SRP Centers can tackle complex biomedical and environmental science and engineering issues identified by stakeholders, bringing a mechanistic understanding to solve some of the vexing problems associated with Superfund. Applicants are expected to design Centers that will contribute to solving a problem (or set of problems) related to SRP's mandates: health effects, risk, detection, and remediation/mitigation of hazardous substances.

Relevance to SRP and Superfund: Given SRP's broad mandates, it is important for interdisciplinary teams to work together to identify research that addresses relevant exposure pathways. Ultimately, problem-solving research seeks to find answers to inform real-life exposures – both in terms of understanding health implications as well as developing remedies for these exposures. For example, basic research generates mechanistic knowledge upstream of its application, but this research should be contextualized in terms of its relevance to environmental exposures. Furthermore, there is an expectation that interdisciplinary teams have considered multiple vantage points in devising their research approach – showing evidence of crosstalk between health, environmental, and exposure research expertise. For these reasons, applicants should assemble teams to address research challenges within a given mandate area, contaminant, or exposure scenario that may have the greatest potential for supporting the SRP's goal of protecting human health and the environment from the impact of hazardous substances.

Link to Additional Information: <http://grants.nih.gov/grants/guide/rfa-files/RFA-ES-20-014.html>

20. Scholarly Editions and Scholarly Translations, National Endowment for the Humanities

Application Deadline: December 2, 2020

The Scholarly Editions and Scholarly Translations program provides grants to organizations to support collaborative teams who are editing, annotating, and translating foundational humanities texts that are vital to learning and research but are currently inaccessible or are available only in inadequate editions or translations. Typically, the texts are significant literary, philosophical, and historical materials, but other types of work, such as musical notation, may also be the subject of an edition.

The program supports continuous full-time or part-time activities during the periods of performance of one to three years. Projects must be undertaken by at least two scholars working collaboratively. While international collaboration is permitted, projects must maintain an equitable balance between scholars at U.S. institutions and scholars at non-U.S. institutions. In addition to supporting long-term editorial projects, the program also encourages applications for short-term projects and for projects that are at a planning stage.

What's new for 2020

- Awards are capped at \$300,000 in outright funds, not to exceed \$100,000 per year. In addition, organizations submitting proposals that respond to the “A More Perfect Union” special initiative may apply for up to an additional \$150,000 in federal matching funds, not to exceed \$50,000 per year.
- Projects at a planning stage are encouraged to apply for one or two years of support for up to \$75,000 per year or less. Additional writing prompts have been added for planning stage projects.

Link to Additional Information: <https://www.neh.gov/grants/research/scholarly-editions-and-translations-grants>

21. Modules for Enhancing Biomedical Research Workforce Training, Department of Health and Human Services, National Institutes of Health

Application Deadlines: Standard NIH for R25's available at: <https://grants.nih.gov/grants/how-to-apply-application-guide/dues-dates-and-submission-policies/dues-dates.htm>

This FOA is intended to encourage and enable the scientific community to create and disseminate training modules that will effectively contribute to the development of the biomedical research workforce. NIGMS intends to fund the development of these training modules in distinct subject areas that are relevant to the current biomedical research workforce. The areas are described through “Notices of Special Interest” found in the “Related Notices” section above.

The training modules are expected to cover material not typically taught as part of current institutional coursework. However, it is expected that the developed modules could be utilized as learning material in future courses to enhance training environments. Materials should address the training needs experienced by the biomedical research workforce. The modules should be targeted to impact individuals from a broad range of scientific disciplines and career stages.

Program Structure for Module Development and Accessibility

This training may take many different types of formats and approaches, but should be timely, informative, engaging, and easily accessible to everyone at no cost. Some general expectations are as follows:

- *Platforms:* The training modules must be freely available at no cost. Examples include, but are not limited to, interactive online modules; videos or case studies with supporting discussion materials, problem sets, etc.; online open courses; and computer-video simulations.
- *Length of awards:* it is expected that all modules will be developed, piloted, and disseminated within the first two years of the award; budgets may be awarded for up to three years to allow module evaluation and module modification/maintenance in year three.
- *Dissemination:* Awardees must ensure that the modules reach a diverse group of biomedical researchers. PD(s)/PI(s) will be expected to participate in at least one meeting held by the NIGMS Division of Training, Workforce Development, and Diversity during the term of the award. The intent is to have the grantees share their knowledge and insights into developing engaging and informative educational modules and subsequently present an overview of the modules they have developed, results of pilots, and evaluations to the wider community.
- *NIGMS portal:* Once the modules have been developed and made available, links to these educational resources will be posted and maintained on the [NIGMS training module clearinghouse web site](#).

Research education programs may complement ongoing research training and education occurring at the applicant institution, but the proposed educational experiences must be distinct from those training and education programs currently receiving Federal support. R25 programs may augment institutional research training programs (e.g., T32, T90) but cannot be used to replace or circumvent Ruth L. Kirschstein National Research Service Award (NRSA) programs.

Link to additional information: <https://grants.nih.gov/grants/guide/pa-files/PAR-20-296.html>

22. National Artificial Intelligence (AI) Research Institutes, National Science Foundation

Application Deadline: December 4, 2020

Artificial Intelligence (AI) has advanced tremendously and today promises personalized healthcare; enhanced national security; improved transportation; and more effective education, to name just a few benefits. Increased computing power, the availability of large datasets and streaming data, and algorithmic advances in machine learning (ML) have made it possible for AI research and development to create new sectors of the economy and revitalize industries. Continued advancement, enabled by sustained federal investment and channeled toward issues of national importance, holds the potential for further economic impact and quality-of-life improvements.

The 2019 update to the [National Artificial Intelligence Research and Development Strategic Plan](#), informed by visioning activities in the scientific community as well as interaction with the public, identifies as its first strategic objective the need to make long-term investments in AI research in areas with the potential for long-term payoffs in AI. The President's Council of Advisors for Science and Technology has published [Recommendations for Strengthening American Leadership in Industries of the Future](#), including AI, and calls for new and sustained research in AI to drive science and technology progress. The National AI Research Institutes program enables longer-term research and U.S. leadership in AI through the creation of AI Research Institutes. This program is a joint government effort between the National Science Foundation (NSF), U.S. Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA), U.S. Department of Homeland Security (DHS) Science & Technology Directorate (S&T), and the U.S. Department of Transportation (DOT) Federal Highway Administration (FHWA). New to the program this year are contributions from partners in U.S. industry who share in the government's goal to advance national competitiveness through National AI Research Institutes. This year's industry partners are Accenture, Amazon, Google, and Intel Corporation. This program solicitation invites proposals for full institutes that have a principal focus in one or more of the following themes, detailed in the Program Description:

- Theme 1: Human-AI Interaction and Collaboration
- Theme 2: AI Institute for Advances in Optimization
- Theme 3: AI and Advanced Cyberinfrastructure
- Theme 4: Advances in AI and Computer and Network Systems
- Theme 5: AI Institute in Dynamic Systems
- Theme 6: AI-Augmented Learning
- Theme 7: AI to Advance Biology
- Theme 8: AI-Driven Innovation in Agriculture and the Food System

Link to additional information: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf20604

23. New Models of Integrated HIV/AIDS, Addiction, and Primary Care Services, Department of Health and Human Services, National Institutes of Health

Application Deadlines: Standard NIH for R01's available at: <https://grants.nih.gov/grants/how-to-apply-application-guide/dues-dates-and-submission-policies/dues-dates.htm>

The purpose of this FOA is to address research gaps in understanding how to improve health outcomes among persons who are at heightened risk for HIV or living with HIV and substance use in the US, and to inform novel strategies for integrating primary care, HIV, and SUD prevention and treatment services. Research is sought that will leverage existing resources available to public health researchers to develop and test new methods and models for implementing prevention and treatment services to improve care for at risk individuals. The FOA will support research that promotes scalable strategies of integrated care and services designed to improve health outcomes related to HIV and SUD. Research applications must incorporate HIV/AIDS and SUD outcomes and the HIV/AIDS outcomes should address the HIV prevention and care continuum (i.e., care engagement, antiretroviral adherence, or viral suppression).

HIV/AIDS is comorbid with many health conditions, including Hepatitis C, substance use disorders and other psychiatric disorders. Prevention and treatment services for HIV/AIDS and these comorbid conditions are typically delivered in multiple settings. This results in fragmented, uncoordinated care and contributes to suboptimal clinical outcomes. The goal of this FOA is to support testing

models of comprehensive care which enable seamless access to and engagement with prevention and treatment services for HIV/AIDS and addiction, as well as services for consequences and comorbidities of substance abuse.

The effects of fragmented, uncoordinated systems of care for HIV/AIDS, SUD, and related conditions are compounded by structural (e.g., geographic distribution of services, reimbursement challenges) and social barriers (e.g., stigma, discrimination). Evidence-based models of integrated care that address HIV, SUD, and primary care in the US hold promise for addressing many of these ongoing continued service engagement barriers and challenges. The goal of this FOA is to develop and test replicable, scalable, and sustainable organizational and systems level interventions that provide comprehensive, integrated evidence-based care that simultaneously optimizes HIV/AIDS, SUD, and other relevant outcomes. Interventions should attend to reducing social and structural barriers to care coordination. Applicants are encouraged to focus on integration or expansion of care in single point of care delivery systems (e.g., Federally Qualified Health Centers, Ryan White providers, Syringe Service Programs, CDC-supported prevention community-based organizations). Existing or newly formed partnerships with such care delivery systems or organizations will be critically necessary for optimal comprehensive care. Participating organizations must have pre-existing collaborative relationships/partnerships or establish collaborative relationships/partnerships by the time of application.

Research objectives and specific areas of interest include but are not limited to studies that:

- Test implementation strategies or models to integrate evidence-based drug abuse prevention or treatment interventions in HIV care settings
- Apply implementation science approaches to translate strategies with demonstrated efficacy or effectiveness in other settings or locations (e.g., low resource international settings)
- Test integrated HIV/AIDS and SUD care models that leverage innovative approaches to incorporate social network components such as peer recovery coaches
- Test integrated HIV/AIDS and SUD care approaches that capitalize on electronic health record systems and other efforts to increase integration within and between health systems
- Test methods for improving the coordination and communication between behavioral health and HIV care providers within and across settings
- Test implementations of direct service and consultation (e.g., project ECHO, the Collaborative Model) models of e-Health as primary modalities of integrated HIV/AIDS & SUD care in resource constrained environments. Identify the mediators and mechanisms through which the integration of the specified services improve HIV and SUD outcomes with cost-effectiveness analyses
- Examine interventions that implement substance use screening, brief intervention and linkage to SUD treatment from settings serving persons at high HIV risk such as STI clinics
- Examine syringe service programs as hubs for providing HIV prevention and care and linkage to SUD treatment

Link to additional information: <https://grants.nih.gov/grants/guide/pa-files/PA-20-273.html>

24. Advanced Laboratories for Accelerating the Reach and Impact of Treatments for Youth and Adults with Mental Illness (ALACRITY) Research Centers, Department of Health and Human Services, National Institutes of Health

Application Deadlines: Standard NIH for P50's available at: <https://grants.nih.gov/grants/how-to-apply-application-guide/due-dates-and-submission-policies/due-dates.htm>

This Funding Opportunity Announcement (FOA) invites applications for center grants to support Advanced Laboratories for Accelerating the Reach and Impact of Treatments for Youth and Adults with Mental Illness (ALACRITY) Centers. The purpose of these research Centers is to support transdisciplinary teams of clinical and mental health services researchers, behavioral scientists, social scientists, health information and communications technologists, health systems engineers, decision scientists, and mental health stakeholders (e.g., service users, family members, clinicians, payers) to engage in high-impact studies that will significantly advance clinical practice and generate knowledge that will fuel transformation of mental health care in the United States. Successful ALACRITY Centers will address major mental health problems observed among children, youth, and/or adults (including older adults), and foster innovative research aimed at increasing the effectiveness of existing interventions, improving delivery and quality of evidence-based services, and accelerating the diffusion, implementation, and continuous improvement of new practices in diverse settings. Center-supported research should reflect a deployment-focused model of intervention and services design and testing that considers key characteristics of the settings and providers where optimized mental health interventions and services will be implemented.

The ALACRITY Centers program is intended to support research that maximizes synergies across disciplines and has a high potential for increasing the public health impact of existing and emerging mental health interventions and service delivery strategies. The

Centers are intended for transdisciplinary projects that could not be achieved using standard research project grant mechanisms. Support is provided both for individual research projects and for cores that are critical for the integration across ALACRITY components. Centers are expected to provide plans for rapid, widespread sharing of relevant data, methods, and resources that will promote near-term improvements in clinical practice, as well as plans that further advance research focused on intervention effectiveness and/or services. A strong vision of how the ALACRITY Center will advance the field beyond the goals of the individual projects is essential for successful applications.

ALACRITY Centers also provide opportunities for graduate students, postdoctoral researchers, and investigators in early stages of independent careers to participate in interdisciplinary research.

The primary purpose of each ALACRITY Center is to support rapid development, testing, and refinement of innovative approaches for (1) optimizing the effectiveness of therapeutic or preventive interventions for mental disorders within well-defined target populations; (2) organizing and delivering optimized mental health services within real world treatment settings; and (3) continuously improving the quality, impact, and sustainability of optimized interventions and service delivery strategies within diverse care systems. To achieve these ambitious goals, each ALACRITY Center aims to support multidisciplinary teams of leading clinical and mental health services researchers, and experts from allied disciplines such as behavioral scientists, social scientists, health information and communications technologists, health systems engineers, decision scientists, and mental health stakeholders (e.g., service users, family members, clinicians, payers) to engage in studies focused on selected populations for whom existing interventions or services do not adequately address urgent, unmet mental health needs.

The NIMH Strategic Plan for Research was developed to inspire and support research that takes advantage of recent technological advances and opportunities, and to bring into sharper focus questions and perspectives that will transform the diagnosis, treatment, and prevention of mental disorders. Strategic Research Objectives 3.2, 3.3, and 4.1 – 4.4, which focus on optimizing existing and new interventions, translating effective interventions to community practice settings, and strengthening the public health impact of NIMH-supported research, are particularly relevant to ALACRITY Centers.

The ALACRITY Centers program provides a mechanism for maximizing synthesis and potential synergies across various components of the mental health research ecosystem, including new discoveries in basic and clinical research, transformative health care technologies, advances in information science, behavioral economic strategies for influencing health behaviors, and new federal and state mechanisms for organizing and financing mental health care. ALACRITY Centers provide a unique opportunity for addressing T2 translational priorities outlined in the NIMH Strategic Plan, i.e., effective transfer of findings from clinical studies to practice settings and communities, where research findings can be applied to improve public health.

Link to additional information: <https://grants.nih.gov/grants/guide/pa-files/PAR-20-293.html>

25. Investigation of the Transmission of Kaposi Sarcoma-Associated Herpesvirus (KSHV), Department of Health and Human Services, National Institutes of Health

Application Deadline: December 14, 2021

Through this Funding Opportunity Announcement (FOA), the National Cancer Institute (NCI) intends to advance our understanding of: the modes of transmission of Kaposi sarcoma-associated herpesvirus (KSHV), also called human herpesvirus-8 (HHV-8); the biology of the initial steps of infection; and the risk factors for infection. Such studies should inform and advance efforts to reduce or eliminate KSHV transmission and thus prevent Kaposi sarcoma (KS), KSHV-associated multicentric Castleman disease (MCD), primary effusion lymphoma (PEL), and other KSHV-induced diseases in populations living with HIV or at high risk of developing HIV infection.

Many questions also remain regarding the biology of KSHV infection. KSHV can infect many different types of cells including epithelial cells, endothelial cells, B lymphocytes, monocytes, and dendritic cells but the mechanism of initial infection remains elusive. There remain a number of questions regarding the initial steps in KSHV infection of the oral cavity (including the tonsils), KSHV factors that enable host cell uptake, local anti-KSHV defenses, the mechanisms by which KSHV evades the initial defenses including immunologic defenses, and the mechanisms by which KSHV establishes stable latency.

Better definition of the routes of KSHV transmission, identification of behaviors linked to transmission, elucidation of the initial steps of infection, and improved tools to identify KSHV infection can potentially inform consideration of public health measures to prevent KSHV transmission and thus prevent KS, KSHV-associated MCD, PEL, and other KSHV-induced diseases in populations living with HIV or at high risk of developing HIV. Furthermore, a better understanding of these key issues may help inform: the design of clinical trials of KSHV transmission prevention strategies; the development of KSHV vaccines; and the selection of initial target populations for testing KSHV vaccines.

Projects proposed in response to this FOA must address research on KSHV, KS, and other KSHV-associated diseases and must be focused on enhancing our understanding of KSHV transmission and infection. In this context, applicants should note that:

- It is anticipated that most proposed projects will involve humans and/or human specimens.
- Projects not involving humans and/or human specimens must clearly indicate how they will address the primary research area of this FOA.

Examples of research areas that are appropriate for the projects to be proposed under this FOA include the following:

- Studies to better define the initial steps in KSHV infection of individuals and the biologic factors that protect against early steps in KSHV infection.
- Studies to better characterize the immune responses to KSHV infection in children and adults that may thwart the establishment of infections.
- Studies to identify the principal modes of KSHV transmission in various high-risk populations.
- Epidemiologic studies to better define the behavioral, environmental, or genetic risk factors for KSHV transmission in people living in endemic and/or non-endemic areas. Such studies could include small clinical trials to test strategies to reduce KSHV transmission.
- Studies to understand why some populations (e.g., Asian) have a lower prevalence of KSHV and lower age-standardized incidence rates of KS, despite similar risk factors and despite similar background rates of other common viral infections/sexually transmitted infections.
- Research to improve upon or simplify existing serological or DNA-based assays for KSHV that can be easily used in clinical settings.

Link to additional information: <https://grants.nih.gov/grants/guide/rfa-files/RFA-CA-20-046.html>

26. Buildings Energy Efficiency Frontiers & Innovation Technologies (BENEFIT) – 2020, Department of Energy, National Energy Technology Laboratory

Application Deadline: Concept Papers – November 5, 2020; Full Application – January 20, 2021

The objective of this Funding Opportunity Announcement (FOA) is to research and develop next-generation building technologies that have the potential for significant energy savings and improved demand flexibility, affordability, and occupant comfort. An additional goal is to advance building construction, remodeling, and retrofit practices, and associated workforces.

The 2020 BENEFIT FOA will invest up to \$80 million across 2 topic areas to allow all interested parties to research and develop high-impact technologies and practices that will improve energy productivity, improve flexibility, security and resilience, as well as lower energy costs.

- Topic 1: Building Technology Research, Development and Field Validation: High-impact, affordable building technologies to improve energy productivity and demand flexibility without negatively impacting occupant comfort.
- Topic 2: Advanced Building Construction: Building envelope R&D and field validation as well as integration of technological and other advances into mass-produced building practices for manufactured homes and modular classrooms, including training issues such as improving quality installations and quality control.

The 2020 BENEFIT FOA permits a broader range of applications, which will help BTO to select the highest-impact awards and fulfill the most important needs for innovation. Applicants to this FOA may consider including field validation as part of their approach to verify technologies and integration practices. Field validation may be used to identify gaps in design and in-field performance. It can be used to support method development data verification, collection, management, and analysis. Applicants may consider third-party validation where beneficial.

All applications are expected to identify the baseline technology or approach, describe the current technology or market deficiencies, and characterize/quantify current performance and cost parameters. Where applicable, the applicant should identify any relevant regulations, efficiency standards, building codes or other barriers which impact the proposed technology and/or approach. The applicant should identify any positive or negative impacts that the proposed technology and/or approach could have on technology integration, specifically related to the integration priorities associated with the Advanced Building Construction and Grid-interactive Efficient Buildings initiatives described above. To the extent possible, technology integration should be considered in energy savings, affordability, demand flexibility, and occupant comfort evaluations described below.

All applications should clearly detail a pathway for overcoming the identified technology and market deficiencies through their approach. This includes a thorough discussion of the proposed technical approach including quantified energy metrics, cost

characteristics, and impact on occupant comfort and quality of life¹⁰. Applicants should clearly state all technical assumptions and provide appropriate data, data analysis, and/or modeling/simulation results to support the proposed approach. Key project risks and mitigation strategies should also be detailed.

Applications are expected to address the specific metrics or goals identified in the subtopic area descriptions below. In most subtopic areas, applicants are expected to address energy savings (technical energy savings potential), affordability (cost of conserved energy), demand flexibility, and occupant comfort.

Link to additional information: <https://eere-exchange.energy.gov/Default.aspx#FoaIdaff0bc6d-95b0-4aa6-901b-2ef0a53e8f7e>

27. Preservation Assistance Grants for Smaller Institutions, National Endowment for the Humanities

Application Deadline: January 14, 2021

Preservation Assistance Grants help small and mid-sized institutions — such as libraries, museums, historical societies, archival repositories, cultural organizations, town and county records offices, and colleges and universities — improve their ability to preserve and care for their significant humanities collections. These may include special collections of books and journals, archives and manuscripts, prints and photographs, moving images, sound recordings, architectural and cartographic records, decorative and fine art objects, textiles, archaeological and ethnographic artifacts, furniture, historical objects, and digital materials.

Applicants must draw on the knowledge of consultants whose preservation skills and experience are related to the types of collections and the nature of the activities on which their projects focus. Within the conservation field, conservators usually specialize in the care of specific types of collections, such as objects, paper, or paintings. Applicants should choose a conservator whose specialty is appropriate for the nature of their collections. Similarly, when assessing the preservation needs of library, museum, or archival holdings, applicants should seek a consultant specifically knowledgeable about the preservation of collections in these types of institutions.

The program encourages applications from small and mid-sized institutions that have never received an NEH grant; community colleges, Hispanic-Serving Institutions, Historically Black Colleges and Universities, and Tribal Colleges and Universities; and Native American tribes and Native Alaskan and Native Hawaiian organizations with significant humanities collections. Furthermore, organizations or collections that represent the contributions of under-represented communities are highly encouraged.

Link to additional information: <https://www.neh.gov/grants/preservation/preservation-assistance-grants-smaller-institutions>

28. Research on Emerging Technologies for Teaching and Learning (RETTL), National Science Foundation

Application Deadline: January 25, 2021

The purpose of the Research on Emerging Technologies for Teaching and Learning (RETTL) program is to fund exploratory and synergistic research in emerging technologies (to include, but not limited to, artificial intelligence (AI), robotics, and immersive or augmenting technologies) for teaching and learning in the future. The program accepts proposals that focus on learning, teaching, or a combination of both. The scope of the program is broad, with special interest in diverse learner/educator populations, contexts, and content, including teaching and learning in science, technology, engineering, and mathematics (STEM) and in foundational areas that enable STEM (e.g., self-regulation, literacy, communication, collaboration, creativity, and socio-emotional skills). Research in this program should be informed by the convergence (synthesis) of multiple disciplines: e.g., learning sciences; discipline-based education research; computer and information science and engineering; design; and cognitive, behavioral, and social sciences. Within this broad scope, the program also encourages projects that investigate teaching and learning related to futuristic and highly technological work environments.

Americans of all ages must be prepared to excel in highly technological, interactive and AI-driven work environments that are increasingly more common. Emerging technologies have the potential to transform teaching and learning, in both formal and informal settings, particularly in support of STEM learning outcomes. This preparation requires radical innovation in teaching and learning in alignment with a key recommendation from America's Strategy for STEM Education to “Expand Digital Platforms for Teaching and Learning.” Further, given the rapidly changing landscape of jobs, skills and work, research in emerging technologies for learning can support just-in-time learning, upskilling, reskilling, and pervasive and lifelong learning.

As the COVID-19 pandemic has led to new unprecedented and unexpected reliance on on-line learning, there is a need to reimagine learning with emerging technologies in support of the new and changing roles of teachers/educators, parents, families, and other

collaborators. Given these critical national needs, it is important to transform learning through innovative teaching, educating, and mentoring practices in a variety of settings, to include formal settings such as physical and virtual classrooms, as well as informal settings (e.g., museums, nature centers, libraries, citizen-science activities, and other on-line experiences).

In the context of these settings, emerging learning technologies must be grounded in the experiences of educators and students, particularly with respect to cognitive, social, and behavioral aspects. Further, while emerging technologies such as AI can lead to exciting new innovations in teaching and learning, they also require careful attention to issues of equity, ethics, bias, privacy and security, as identified in the National Artificial Intelligence Research and Development Strategic Plan: <https://www.nitrd.gov/pubs/National-AI-RD-Strategy-2019.pdf>. Projects should engage a wide range of stakeholders (e.g., students, teachers, mentors, and families) as partners in the co-design process to address these issues intentionally.

Given the complexities surrounding the development of technology and learning environments, high-impact research requires interdisciplinary teams, with expertise across disciplines, including but not limited to learning sciences, discipline-based education research, computer science, engineering, human-computer interaction, design, social and behavioral sciences together with ethics, policy, and privacy. This program envisions cross-disciplinary teams that approach teaching and learning technologies with complementary perspectives and scientific rigor.

Link to additional information: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf20612

29. Specialized Programs of Research Excellence (SPOREs) in Human Cancers for Years 2021, 2022, and 2023 (P50 Clinical Trial Required), Department of Health and Human Services, National Institutes of Health

Application Deadlines: Standard NIH for P50's available at: <https://grants.nih.gov/grants/how-to-apply-application-guide/dues-dates-and-submission-policies/dues-dates.htm>

Through this funding opportunity announcement (FOA), the National Cancer Institute (NCI) invites applications for P50 Research Center Grants for Specialized Programs of Research Excellence (SPORE). The program will fund P50 SPORE grants to support state-of-the-art investigator-initiated translational research that will contribute to improved prevention, early detection, diagnosis, and treatment of an organ-specific cancer or a highly related group of cancers. For the purpose of this FOA, a group of highly related cancers are those that are derived from the same organ system, such as gastrointestinal, neuroendocrine, head and neck, and other cancers. Other programmatically appropriate groups of cancers may include those centered around a common biological mechanism critical for promoting tumorigenesis and/or cancer progression in organ sites that belong to different organ systems. For example, a SPORE may focus on cancers caused by the same infectious agent or cancers promoted and sustained by dysregulation of a common signaling pathway. In addition, a SPORE may focus on cross-cutting themes such as pediatric cancers or cancer health disparities. The research supported through this program must be translational and must stem from research on human biology using cellular, molecular, structural, biochemical, and/or genetic experimental approaches. SPORE projects must have the goal of reaching a translational human endpoint within the project period of the grant.

This Funding Opportunity Announcement (FOA) invites applications for P50 Research Center Grants for Specialized Programs of Research Excellence (SPOREs) in organ-specific, groups of highly related cancers, or cancers driven by common activation pathways or cross-cutting themes. This FOA targets applicant institutions with a demonstrated ability to conduct translational research (see key definitions) in the prevention, early detection, diagnosis, and/or treatment of human cancer. Applications focusing on novel cross-cutting themes are encouraged, including, but not limited to: targeting of commonly mutated oncogenes or reactivating tumor suppressor genes; cancers centered around a common biological mechanism; pediatric cancers; or cancer health disparities. Applicants are encouraged to consult with NCI staff members in the [Translational Research Program](#) (TRP) regarding the focus of their application.

All proposed SPORE projects must be translational. In every SPORE project, the development of new cancer-relevant interventions should include both a laboratory component and a human endpoint that must be reached during the project period of the grant.

In each SPORE project, at least one of the following types of human endpoints should be proposed:

- Early phase clinical trials of new investigational drugs, biologics, experimental procedures, medical devices, or combinations;
- Early phase clinical trials of new combinations or new uses of Food and Drug Administration (FDA)-approved agents and devices;
- Discovery and development of biomarkers, only when measurements are made in human specimens, or directly in human subjects;
- Laboratory studies that begin with an observation in the clinic and use human specimens to generate new clinical hypotheses;

- Population, behavioral, or psychosocial studies, when these studies address and measure mechanistic aspects of the biology of the disease;
- Investigational new drug (IND)-directed toxicology studies conducted following a pre-IND meeting with the FDA in which the plan proposed by the investigators is acceptable to the FDA.
- Experiments using cell lines, xenografts, patient-derived xenografts (PDX), organoids, paired germline samples, or engineered tissues may be important to the translational studies proposed and are encouraged, but are not sufficient to meet the human endpoint requirement.

All SPOR applications must include at least one project that proposes, as a specific aim, a SPOR investigator-initiated clinical trial. The clinical trial can also serve as the required human endpoint for that proposed project. An IND-directed toxicology study can serve as a human endpoint, but it is not sufficient to satisfy the clinical trial requirement. Inherent in this process is the interdependence between investigators conducting basic and applied research. Clinical and/or epidemiological research that does not include a wet laboratory or imaging component is not considered translational for the SPOR.

Link to additional information: <http://grants.nih.gov/grants/guide/pa-files/PA-20-305.html>

