NJIT Research Newsletter

Issue: ORN-2018-38

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

Grant Opportunity Alerts

Keywords and Areas Included in the Grant Opportunity Alert Section Below

NSF: Enabling Early-Stage Secure and Trustworthy Cyberspace (SaTC) Socio-Technical Interdisciplinary Collaborations; Understanding the Rules of Life: Epigenetics; Understanding the Rules of Life: Building a Synthetic Cell: An Ideas Lab Activity; Big Data Regional Innovation Hubs (BD Hubs); Formal Methods in the Field (FMitF); Cyberinfrastructure for Biological Research (CIBR); Instrument Capacity for Biological Research (ICBR); Infrastructure Innovation for Biological Research (IIBR); Infrastructure Capacity for Biology (ICB) Core Programs
NIH: BRAIN Initiative Cell Census Network (BICCN) ? Scalable Technologies and Tools for Brain Cell Census (R01); NIH Blueprint Program for Enhancing Neuroscience Diversity through Undergraduate Research Education Experiences (R25); Imaging - Science Track Award for Research Transition (I/START) (R03); BRAIN Initiative: Team-Research BRAIN Circuit Programs - TeamBCP (U19); NLM Research Grants in Biomedical Informatics and Data Science (R01); BRAIN Initiative: Research Opportunities Using Invasive Neural Recording and Stimulating Technologies in the Human Brain (U01
Department of Defense/US Army/DARPA/ONR: Microsystems Technology Office (MTO); AFRL/RXC Structural Materials Open BAA; Information Innovation Office (I2O); BROAD AGENCY ANNOUNCEMENT (BAA) for Extramural Biomedical Research and Development; NRL Long Range Broad Agency Announcement (BAA) for Basic and Applied Research
Department of Education: Institute of Education Sciences (IES)
EPA: Practical Methods to Analyze and Treat Emerging Contaminants (PFAS) in Solid Waste, Landfills, Wastewater/Leachates, Soils, and Groundwater to Protect Human Health and the Environment
Department of Energy: Big Data Analysis of Synchrophasor Data; Advanced Solar Systems Integration Technologies Notice of Intent (NOI); Machine Learning for Geothermal Energy

NASA: Solar System Exploration Research Virtual Institute Cooperative Agreement Notice (SSERVI CAN-3)**;** Use of the NASA Physical Sciences Informatics System - Appendix E National Endowment of Humanities: Humanities Connections Implementation Grants
American Chemical Society: Doctoral New Investigator (DNI) Grants
RWJ Foundation: Pioneering Ideas and a Culture of Health
Gates Foundation: Grand Challenges Explorations

Special Announcement

Limited Submission Internal Competition for NSF MRI and NRT Programs

Grant Program: NSF Major Research Instrumentation Program: (MRI)
Agency: National Science Foundation NSF 18-513
RFP Website: https://www.nsf.gov/pubs/2018/nsf18513/nsf18513.htm
Brief Description: The Major Research Instrumentation (MRI) Program serves to increase access to multi-user scientific and engineering instrumentation for research and research training in our Nation's institutions of higher education and not-for-profit scientific/engineering research organizations. An MRI award supports the acquisition or development of a multi-user research instrument that is, in general, too costly and/or not appropriate for support through other NSF programs.
MRI provides support to acquire critical research instrumentation without which advances in fundamental science and engineering research may not otherwise occur. MRI also provides support to develop next-generation research instruments that open new opportunities to advance the frontiers in science and engineering research. Additionally, an MRI award is expected to enhance research training of students who will become the next generation of instrument users, designers and builders.
An MRI proposal may request up to $4 million for either acquisition or development of a research instrument. Beginning with the FY 2018 competition, each performing organization may submit in *revised* "Tracks" as defined below, *with no more than two submissions in Track 1 and no more than one submission in Track 2*.

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

Consistent with the America COMPETES Act of 2007 (Public Law 110-69), cost sharing of precisely 30% of the total project cost is required for Ph.D.-granting institutions of higher education and for non-degree-granting organizations. Non-Ph.D.-granting institutions of higher education are exempt from the cost-sharing requirement and cannot include it. National Science Board policy prohibits voluntary committed cost sharing.
Please see the solicitation text for organizational definitions used by the MRI program.
The MRI Program especially seeks broad representation of PIs in its award portfolio, including women, underrepresented minorities and persons with disabilities. Since demographic diversity may be greater among early-career researchers the MRI program also encourages proposals with early-career PIs and proposals that benefit early-career researchers.
Awards Range: $100,000-$4 million; **Anticipated Funding Amount:** $75,000,000
Letter of Intent: Not Required
Submission Deadline: January 01, 2019 - January 22, 2019
Limit on Number of Proposals per Organization:

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

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

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

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

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

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

Internal Competition Deadline to College Dean's Office: November 1, 2018: Please submit up to 5 pages pre-proposal white paper to your respective Dean by November 1, 2018 in the following format. College level reviews will be conducted by Deans to forward recommendations for up to 2 proposals to the Office of Research and Development by November 7, 2018. The final selection will be announced by November 15, 2018. The following format for the pre-proposal is suggested which is consistent with actual proposal guidelines and review criterion:

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

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

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

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

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

(b) Research Activities to be Enabled

(c) Description of the Research Instrumentation and Needs

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

(e) Management Plan

4. Preliminary Budget and Budget Justification; and Required Cost-Sharing
5. Brief biographical sketch of PI with a brief description of current and previous accomplishments.

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

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

Instrument Acquisition Proposals.

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

Instrument Development Proposals:

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

Limited Submissions Internal Competitions: NSF NRT Program

Grant Program: NSF National Science Foundation Research Traineeship (NRT) Program
Agency: National Science Foundation NSF 18-507
RFP Website: https://www.nsf.gov/pubs/2018/nsf18507/nsf18507.htm
Brief Description: The NSF Research Traineeship (NRT) program is designed to encourage the development and implementation of bold, new, and potentially transformative models for STEM graduate education training. The NRT program seeks proposals that explore ways for graduate students in research-based master's and doctoral degree programs to develop the skills, knowledge, and competencies needed to pursue a range of STEM careers.

The program is dedicated to effective training of STEM graduate students in high priority interdisciplinary research areas, through the use of a comprehensive traineeship model that is innovative, evidence-based, and aligned with changing workforce and research needs. For FY2018, proposals are requested in any interdisciplinary research theme of national priority, with special emphasis on two high priority areas: (1) Harnessing the Data Revolution (HDR) and (2) Innovations at the Nexus of Food, Energy, and Water Systems (INFEWS). HDR is expected to continue as a priority research area for FY2019 and FY2020 competitions, along with a new priority area to be announced in 2018.

The NRT program addresses workforce development, emphasizing broad participation, and institutional capacity building needs in graduate education. Strategic collaborations with the private sector, non-governmental organizations (NGOs), government agencies, national laboratories, field stations, teaching and learning centers, informal science centers, and academic partners are encouraged. NRT especially welcomes proposals that will pair well with the efforts of NSF INCLUDES to develop STEM talent from all sectors and groups in our society (https://www.nsf.gov/news/special_reports/nsfincludes/index.jsp). Collaborations are encouraged between NRT proposals and existing NSF INCLUDES projects, provided the collaboration strengthens both projects.
Limited Number of Submission: 2: An eligible organization may participate in two proposals per competition. **Participation includes serving as a lead organization, non-lead organization, or subawardee on any proposal.** Organizations participating solely as evaluators on projects are excluded from this limitation. Proposals that exceed the institutional eligibility limit (beyond the first two submissions based on timestamp) will be returned without review regardless of the institution's role (lead organization, non-lead collaborative, or subawardee) in the returned proposal.
Limit on Number of Proposals per PI or Co-PI: 1: An individual may serve as Lead Principal Investigator (PI) or Co-PI on only one proposal submitted to the NRT program per annual competition. Proposals that exceed the PI/Co-PI eligibility limit (beyond the first submission based on timestamp), will be returned without review regardless of the individual's role (PI or co-PI) in the returned proposal.
Awards Range: Standard Grant; **Anticipated Funding Amount:** $36,100,000
Letter of Intent: Submission of Letters of Intent is required. Please see the full text of this solicitation for further information.
Submission Deadline: Letter of Intent Due Date(s) ***(required)*** (due by 5 p.m. submitter's local time): November 26, 2018 - December 06, 2018

- **Full Proposal Deadline(s)** (due by 5 p.m. submitter's local time): February 06, 2019

Contact: Laura B. Regassa, telephone: (703) 292-2343, email: lregassa@nsf.gov

- Tara L. Smith, telephone: (703) 292-7239, email: tsmith@nsf.gov
- Stephen Mulkey, telephone: (703) 292-8954, email: smulkey@nsf.gov

Internal Competition Deadline to College Dean's Office: November 15, 2018: Please submit a pre-proposal for internal competition in the following format to your Dean. Dens are requested to forward the

pre-proposals with their recommendations to the Office of Research for institutional review by November 22, 2018. The pre-proposal should include:

Section 1. Letter of Intent (NSF Format): Submit a one-page LOI through FastLane during the open submission window with the following information:

- The name and departmental affiliation of the Principal Investigator (PI).
- The name(s) and departmental affiliation(s) of the Co-PI(s) and others composing the Core Participants (maximum 10).
- The names(s) of any other (non-lead) participating institutions or organizations. If the sole contribution of the partner is evaluation, then designate as "*Evaluation: institutional or organizational name*"; evaluators are exempt from institutional eligibility limits (see section IV). If there are partnering institutions, then the LOI MUST include the appropriate mandatory statement at the end of the project synopsis (see Project Synopsis below).
- Project Title: The title must begin with "NRT-HDR:" or "NRT-INFEWS:" for projects targeting the Harnessing the Data Revolution or Nexus of Food, Energy, and Water Systems research areas, respectively. Titles for projects addressing another interdisciplinary theme of national importance must begin with "NRT:". Any collaborative project with proposals from multiple institutions should begin with "Collaborative Research:". For example, a collaborative proposal in INFEWS would have a title beginning "Collaborative Research: NRT-INFEWS:"
- Project Synopsis (up to 2500 text characters including required organizational statement): Provide a brief summary of the vision and goals of the proposed training program, including a brief description of the interdisciplinary research theme, the main training elements, the integration of the research and training, and the need for the program. Add the appropriate**required partner organization statement** at the end of the project synopsis. If the project has a partner institution that is not solely an evaluator, then the following text must appear at the end of the project synopsis: "*The participating institutions and organizations have agreed to partner on this NRT project. The NRT-eligible institutions have been informed by the lead organization that serving as a non-lead organization or subawardee on a proposal where the institution appears in the budget will count toward their institutional eligibility limit of two NRT proposals per annual competition."* NRT-eligible institutions are universities and colleges accredited in and having a campus located in the U.S. that award a research-based master's degree and/or a doctoral degree in a STEM discipline supported by the National Science Foundation. If the project has no NRT-eligible partner institutions or if the only NRT-eligible institution solely has an evaluation role (and has been designated as such, see participating institution instructions above), then the following text is required at the end of the project synopsis: "*There are no NRT-eligible institutions partnering on this project outside of an evaluation role."*
- Target Disciplines: List up to 5 primary disciplinary areas contributing to the research focus.

Section 2. Tentative Budget Summary: Please provide itemized budget for the entire duration

Section 3. Biographical Sketch of the PI (NSF Format)

2018 Rutgers BHI, RU-Newark, NJIT Pilot Grants Program in Neuroscience

$40,000 Faculty Neuroscience Seed Grants

We are pleased to announce the 2018 pilot grants program in neuroscience at Rutgers University. There are two main objectives of these pilot awards program: (i) to foster **new** collaborative, interdisciplinary research in the neurosciences among full-time resident faculty across Rutgers and at NJIT, and (ii) support pilot experiments that will lead to sustained funding from an external agency (e.g., NIH). There are two

categories of pilot grants available; each award is limited to **$40,000** direct costs and no indirect costs or overhead are allowed. For both type of pilots, collaborative multidisciplinary efforts are encouraged. The deadline for these applications is **5 PM, Monday, October 8th, 2018**. Submit a SINGLE PDF file to bhi@ca.rutgers.edu .The two categories of awards are:

- Translational neuroscience awards – these must address disease mechanisms, focusing on diagnosis, tools or treatments that involve animal models, clinical studies, or basic neuroscience relevant to a future clinical application. *The clinical relevance must be clearly described in the Research Plan*. These pilots **require *at least*2 full-time resident faculty Co-PIs** with appointments from **different Schools** across Rutgers. Formation of teams that integrate basic and clinical themes with a vision of a future translational impact will have preference. **Six** translational pilots are available and are funded by the BHI. Four out of the six BHI-funded pilot awards will only be for applications submitted by faculty co-PIs from RU-New Brunswick and RBHS (note that PIs *have to be from different Schools*). The other two pilot awards may include co-PIs from RU-Newark and NJIT.
- Basic neuroscience awards – These can include a focus on more basic neural mechanisms, or focus on translational neuroscience experiments involving an animal model or clinical studies. These Basic awards **must include *at least* 2 full-time resident faculty Co-PIs**, with ***at least one of the co-PI's*** being from outside RU-Newark (in case of the **two** award funded by the RU-Newark Chancellor's Research Office), or outside NJIT (in case of the **one** award funded by NJIT).

Format: All applications should be formatted as an R21 NIH style application (**1 page** Specific Aims and **6 pages** for the Research Plan). Include Literature Cited, and, if applicable, sections on Vertebrate Animals, Protections for Human Subjects and Inclusion of Women, Minorities, and Children. Also include Budget, Budget Justification, NIH Biosketches for all Co-PIs, Facilities and Resources and Equipment information. Within the Research Plan under the Innovation section please describe explicitly how the pilot funding will promote new collaborations and/or new projects. The application should be single-spaced, use font/size Arial 11 with 0.5 inch page margins. *Funded*applicants from last year seeking a second year of funding must include in addition a **1 page** Introduction that gives a report of progress made in Year 1, grants and papers submitted as well as a clear justification for the need of second year of funding. All applications **must include** the Cover page (Title, co-PI's, institutions, etc.) and the Submission Check List accompanying this announcement (Click here to download). The application should be combined into one PDF document with the Cover page in the front. Only grant award recipients will need to submit the RAPSS Endorsement form and proof of University's FCOI compliance. IRB and IACUC approvals will also need to be submitted post-award using the Just-In-Time (JIT) approach. These forms and approvals are not required at the time of initial grant application submission on October 8th; however, awardees will have to submit these items before the funds from the grant award are disbursed. We anticipate that the award announcement will be made in January 2019. It is recommended that the applicants prepare and submit the IACUC/IRB applications associated with the pilot grant project well in advance, to the appropriate institutional committees, in order to get these approvals in a timely-fashion.

Please note-the pilot award funds cannot be used for PI and co-PI salaries. Pilot funds can be budgeted for post-doc, student and research technician stipends and salaries. Purchase of equipment costing more than $5000 needs to be well-justified in the budget. The entire application, including the Cover page & Check List, should be combined into one PDF document with the Cover page in the front. Submit the SINGLE PDF file to bhi@ca.rutgers.edu **5 PM, Monday, October 8th, 2018.**

All grants will undergo a dual stage review process, organized by the Brain Health Institute in collaboration with RU-Newark and NJIT. They will have an initial external review to judge scientific

quality and assigned a priority score by external reviewers (similar to NIH study section review). They then will be reviewed by an internal committee (similar to an NIH Council Review) to allocate funds consistent with the long-term strategies for developing neuroscience research at Rutgers and NJIT and the source of pilot funds. One main factor in determining funding will be perceived likelihood that the pilot data generated will lead to external funding.

All pilot awardees will be required to submit a final progress report within 2 months of the end of the award. This report will include publications and grant applications submitted, as well as results obtained and significance of those results. One PI also will be required to orally present results of the studies at the Annual BHI symposium.

Awards will be announced by January 2019. Additional pilot funding may be available next year; successful applicants from this round can apply for a second year of funding at that point but will compete with new applications as well.

Please contact Gary Aston-Jones or Eldo Kuzhikandathil (bhi@ca.rutgers.edu), Piotr Piotrowiak (piotr@newark.rutgers.edu) or Atam P Dhawan (atam.p.dhawan@njit.edu) with questions.
Gary Aston-Jones, Ph.D., Director, Brain Health Institute, Rutgers University/Rutgers Biomedical and Health Sciences
Piotr Piotrowiak, Ph.D., Acting Vice Chancellor for Research and Collaborations, RU-Newark
Atam P Dhawan, Ph.D., Vice Provost for Research and Development, New Jersey Institute of Technology

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Event: Presentation of NJIT Board of Overseers Excellence in Research Prize & Medal and Excellence in Research Lifetime Achievement Award
When: October 4, 2018; 5.30 PM
Where: 112 Eberhardt; Live Steaming at https://www.njit.edu/boards/excellence-research-prize-medal/
Brief Description: The NJIT Board of Overseers is proud to award **Edward L. Dreizin, Ph.D.**, distinguished professor in the Otto H. York Department of Chemical and Materials Engineering, **Dale Gary, Ph.D.**, distinguished professor in the Department of Physics, and **Farzan Nadim, Ph.D.**, professor in the Department for Biological Sciences, its eleventh annual Excellence in Research Prize and Medal.

Edward L. Dreizin, Ph.D. is a Distinguished Professor and Associate Chair for Graduate Studies in the Otto H. York Department of Chemical and Materials Engineering at New Jersey Institute of Technology (NJIT). Prof. Dreizin was the recipient of the Excellence in Research Award from Newark College of Engineering (NCE) in 2012 and 2017; he also received the NCE Excellence in Teaching Award for graduate instruction in 2015. Dreizin has authored and co-authored more than 250 peer-reviewed journal papers, several book chapters and holds four patents. He advised 17 graduated Ph.D. students as well as multiple M.S. students and undergraduates involved in research with his group at NJIT. He serves as an associate editor for the *International Journal of Energetic Materials and Chemical Propulsion*, as a Member of the International Editorial Council for *Combustion Explosions and Shockwaves*, and as a Member of the Editorial Board for the *International Journal of Self-Propagating High-Temperature Synthesis*. He served as the editor for the 2012 Volume of the Materials Research Society Proceedings, entitled *Properties*, *Processing, and Applications of Reactive Materials*. He has given invited lectures in China, Singapore, Russia, Italy, Canada, as well as at multiple U.S. universities, companies and government laboratories. Dreizin's research is mostly in the areas of reactive materials and metal combustion. Over the years, his work applied materials science concepts to explore, understand and improve processes of metal combustion, important for the development of advanced propellants, explosives and pyrotechnics.

Dale Gary, Ph.D. joined the faculty of New Jersey Institute of Technology in 1997, where he is now a distinguished professor in the Center for Solar-Terrestrial Research, in the Department of Physics. Gary is also Director of the Owens Valley Solar Array radio facility near Big Pine, California. His research involves the study of the basic physical processes occurring on the Sun that produce radio emission, and what that can tell us about the acceleration of particles to high energies in solar flares. Gary is also an expert in radio interferometry instrumentation and techniques and serves in an advisory capacity for several radio facilities around the world. Gary has been a leader in the use of solar radio data for examining the conditions under which radio bursts associated with solar flares can disturb or disrupt entirely cellular telephone signals emanating from cell tower sites. He was involved in the discovery that such bursts also cause failures in Global Positioning System (GPS) receivers, which can affect GPS location services over the entire sunlit hemisphere of Earth. His research is essential to understanding and mitigating the conditions under which such deleterious effects of solar events can occur. Gary is the author of more than 140 articles in scholarly journals. He was recently elected vice chair of the Solar Physics Division of the American Astronomical Society. He received his Ph.D. in astrogeophysics from the University of Colorado.

Farzan Nadim, Ph.D. has a Ph.D. in mathematics from Boston University (1994) and was a postdoctoral fellow in neurobiology at Emory University and a Sloan Postdoctoral Fellow in Theoretical Neuroscience at Brandeis University (1995-1998). Since 1998, he has been a faculty member in Biological Sciencesand Mathematical Sciences at NJIT. Nadim's research, continuously funded by the National Institutes of Health (NIH) since 1999, utilizes electrophysiology experiments and computational models to understand how properties of neurons and synapses result in network oscillations in the nervous system, and how these properties are modified by neuromodulatory substances. He has served as Reviewing Editor of the *Journal of Neuroscience* (2009-2016), Director of the Organization for Computational Neuroscience (2013-2016), Faculty Member and Cycle Director of the Neural Systems and Behavior Course at the Marine Biological Laboratory (1998-2017), and Section Editor of the *Encyclopedia of Computational Neuroscience* (2014-present). Nadim also served on numerous NIH panels, including the Sensorimotor Integration Study Section (2010-2014), which he chaired, and multiple panels of the Presidential Brain Initiative. He is a recipient of the Alfred P. Sloan Research Fellowship 1999 and the Ellen & Albert Grass Foundation Faculty Fellowship 2006.

Event: NJIT Big Data Seminar: Predictive Analytics using Amazon Web Services
Speaker: Dr. Sanjay Padhi, Amazon
When: November 5, 2018; 2.30 PM – 3.30 PM
Where: GITC 3710
Website: https://web.njit.edu/cs/CS_Seminar/
Abstract: One of the most explored features of Big Data is predictive analytics. Predictive analytics is a set of techniques that are fundamental to large organizations like Amazon. Methods such as Machine Learning are used in many aspects of life, including health care, education, financial modeling, and marketing. Analytics on Big Data has given rise to various "smart" projects, such as Connected Intersections, Smart Cities, and Smart Health. This talk will provide a range of such studies using predictive analytics including detailed overview of methods such as Machine Learning (ML) and Deep Learning using AWS. Fully managed Artificial Intelligence (AI) services to help researchers build, train and deploy ML models in various domains including Computer Vision and Natural Language Processing (NLP) will also be outlined. Supervised and unsupervised based learning frameworks and its implications in the fields of Scientific Computing, Medical Imaging, Cancer detection, Diabetic Retinopathy, and Voice-enabled solutions to improve management of chronic disease will be discussed. The AWS Research

Initiative with funding agencies such as the National Science Foundation (NSF) in the domains related to the foundation and innovative tracks, as well as AWS Research Credit program will also be outlined.
About the speaker: Dr. Sanjay Padhi, leads the AWS Research Initiatives including AWS's federal initiatives with the National Science Foundation. Dr. Padhi has more than 15 years of experience in large-scale distributed computing, Data Analytics and Machine Learning. He is the co-creator of the Workload Management System currently used for all the data processing and simulations by CMS, one of the largest experiments in the world at CERN, consisting of more than 180 institutions across 40 countries. He also co-founded the ZEUS Computing Grid project at Deutsches Elektronen-Synchrotron (DESY), Germany before joining CERN. Sanjay obtained his Ph.D. from McGill University in High Energy Physics and is also currently appointed by the Dean of Faculty as an Adjunct Professor of Physics at Brown University.

Recent Research Grant and Contract Awards

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

PI: Murat Guvendiren (PI)
Department: Chemical and Material Engineering
Grant/Contract Project Title: 3D Print Pliable and Multiphasic Scaffolds
Funding Agency: Acuitive Technologies, Inc
Duration: 09/17/18-07/16/19

PI: Murat Guvendiren (PI)
Department: Chemical and Material Engineering
Grant/Contract Project Title: A Proof-of-Concept Study on 3D Printability of High Performance Thermoplastics
Funding Agency: Greene Tweed Services LLC
Duration: 09/15/18-08/31/19

PI: Tara Alvarez (PI)
Department: Biomedical Engineering
Grant/Contract Project Title: Functional Mechanisms of Neural Control in Convergence Insufficiency
Funding Agency: NIH
Duration: 04/01/14-03/31/19

PI: Evans Deane (PI)
Department: Center for Building Knowledge
Grant/Contract Project Title: Office of Clean Energy Program: The Clean Energy Learning Center
Funding Agency: NJ Board of Public Utilities
Duration: 10/08/15-06/30/19

PI: William Marshall (PI)
Department: Office of Research
Grant/Contract Project Title: Value Engineering for Enhanced Workforce Development, Training, and Technology Demonstrations
Funding Agency: U.S. Army (Picatinny Arsenal)
Duration: 09/21/17-09/21/19

PI: William Marshall (PI), John Federici (Co-PI), Somenath Mitra (Co-PI) and Ian Gatley (Co-PI)
Department: Office of Research, Physics, Chemistry and Environmental Sciences
Grant/Contract Project Title: Advanced Manufacturing for Weapon Systems Standardization and Effectiveness (AMWSSE)
Funding Agency: U.S. Army (Picatinny Arsenal)
Duration: 09/27/17-09/27/19

PI: William Marshall (PI), John Federici (Co-PI) and Ian Gatley (Co-PI)
Department: Office of Research, Physics
Grant/Contract Project Title: Transformative Manufacturing Enhancements for Munitions and Weapon Systems Standardization and Effectiveness (TMEMWSS)
Funding Agency: U.S. Army (Picatinny Arsenal)
Duration: 09/26/18-09/26/19

PI: Murat Guvendiren (PI)
Department: Chemical and Material Engineering
Grant/Contract Project Title: A Proof-of-Concept Study on 3D Printability of High Performance Thermoplastics
Funding Agency: Greene Tweed Services LLC
Duration: 09/15/18-08/31/19

PI: Xiaoyang Xu (PI)
Department: Chemical and Material Engineering
Grant/Contract Project Title: Engineering Nanoparticles for Brain Drug Delivery
Funding Agency: NJ Health Foundation
Duration: 09/11/18-09/10/19

PI: Sergei Adamovich (PI), Ghaith Androwis (Co-PI) and Siakat Pal (Co-PI)
Department: Biomedical Engineering
Grant/Contract Project Title: Rehabilitation Engineering Research Center on Wearable Robots
Funding Agency: DHHS (NIDILRR)
Duration: 09/30/15-09/29/20

PI: Gregory Fleishman (PI)
Department: Center for Solar Terrestrial Research
Grant/Contract Project Title: Impulsive Ion Escape at the Sun
Funding Agency: NASA
Duration: 06/20/16-06/19/19

In the News…

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

President Signs Major Spending Bill: The $855.1 billion Defense and Labor-HHS-Education appropriation contains $675 billion for defense--the fist time the U.S. military has received a full year's funding at the start of a fiscal year since 2009. The legislation once again prevents NIH from changing policies related to indirect cost rates, which govern the agency's reimbursement of

research institutions for facilities and administrative expenses. The National Institutes of Health is receiving a $2 billion or 5 percent spending increase in fiscal year 2019, bringing the agency's budget to $39 billion. The boost is part of a two-bill spending package Congress approved this week that provides final appropriations for the Departments of Defense, Education, and Health and Human Services (HHS), the parent agency of NIH.

The statement directs NIH to transfer $5 million to the HHS Office of the Inspector General to *"examine NIH's oversight of its grantees' compliance with NIH policies, including NIH efforts to ensure the integrity of its grant application and selection process*." It also directs the office to examine the *"effectiveness of NIH's and grantee institutions' efforts to protect intellectual property derived from NIH-supported research."* The statement makes clear these funds are provided on top of the amount the office currently dedicates to overseeing NIH.

21st Century Cures initiatives. The NIH budget increase includes $711 million provided by the 21st Century Cures Act, a major medical research law enacted in 2016 that provides dedicated funding for the Cancer Moonshot, BRAIN, and Precision Medicine Initiatives. Overall Cures Act funding for these initiatives is increasing by $215 million.

More information is posted on https://www.aip.org/fyi/2018/final-fy19-appropriations-national-institutes-health

DOE Awards $218 Million for Quantum Research: The 85 projects funded by the Department of Energy "are led by scientists at 28 institutions of higher learning across the nation and nine DOE national laboratories and cover a range of topics--from developing hardware and software for a new generation of quantum computers, to the synthesis and characterization of new materials with special quantum properties, to probing the ways in which quantum computing and information processing provide insights into such cosmic phenomena as Dark Matter and black holes," the DOE announcement says."It is known that quantum computers—once fully mature systems are developed and deployed—will be capable of solving certain large, extremely complex problems that lie entirely beyond the capacity of even today's most powerful supercomputers.

NEXT-GEN Research Centers: The National Science Foundation has awarded some 60 planning grants to institutions hoping to establish new Engineering Research Centers. The agency is expected soon to announce its overall approach, following last year's National Academies' report and subsequent biennial ERC meeting. Browse the abstracts.

Harnessing the Data Revolution: The National Science Foundation lists a series of opportunities for researchers as part of this "big idea," including: Critical Techniques, Technologies and Methodologies for Advancing Foundations and Applications of Big Data Sciences and Engineering (BIGDATA); Cyberinfrastructure for Sustained Scientific Innovation (CSSI) - Data and Software: Elements and Frameworks; Resource Implementations for Data Intensive Research in the Social, Behavioral and Economic Sciences (RIDIR); and Partnerships between Science and Engineering Fields and the NSF TRIPODS Institutes (TRIPODS + X). Find the individual links by clicking here. The RFP is included in the Grant Opportunity section below.

NIH's 'VENTURE CAPITAL' ARM: NIH's durable Common Fund addresses "emerging scientific opportunities and pressing challenges in biomedical research that no single NIH Institute or Center (IC) can address on its own, but are of high priority for the NIH as a whole." Its programs are "short-term, goal-driven strategic investments, with deliverables intended to catalyze research across multiple biomedical research disciplines." The most recent opportunities include (https://commonfund.nih.gov/grants/fundedresearch):

- Acute to Chronic Pain Signatures (A2CPS)
- Extracellular RNA Communication
- Gabriella Miller Kids First
- Glycoscience
- NIH Director's Early Independence Award
- NIH Director's New Innovator Award
- NIH Director's Pioneer Award
- NIH Director's Transformative Research Award
- Illuminating the Druggable Genome
- Somatic Cell Genome Editing
- Stimulating Peripheral Activity to Relieve Conditions (SPARC)

NSF Implements 10 Big Ideas Plan for Transformative Research: NSF's strategic plan for FY 2018-2022 emphasizes on innovative and transformative research in many areas from transportation to manufacturing and agriculture. From the NSF strategic plan 2018-2022 (https://www.nsf.gov/pubs/2018/nsf18045/nsf18045.pdf): "Scientific breakthroughs start with a question, a big idea, about the nature of things that often leads to a fundamental shift in thinking. The ability to pursue and investigate that question, and to innovate along the way, is what enables the discoveries that ultimately transform the world. This plan illustrates the opportunities ahead with examples from some of NSF's "10 Big Ideas" for future investment. These bold, long-term research questions consider critical societal challenges and important lines of scientific inquiry where NSF aims to catalyze new breakthroughs. Partnerships with other federal agencies, nonprofits, private-sector collaborators, industry partners and the public will help advance these research areas. This plan also underscores where greater investments are needed; for example, in research infrastructure and broadening participation in the science, technology, engineering and mathematics (STEM) workforce. As highlighted in the 2018 Science and Engineering Indicators report, the number of non-STEM jobs requiring STEM skills is now on par with the number of STEM jobs in the U.S. As societies around the world transition to more knowledge-based economies, NSF is committed to preparing a 21st century workforce and ensuring that talented individuals from all sectors of our society have access to STEM learning.". The ten big ideas for NSF investments are:

- **Harnessing the Data Revolution**
- **The Future of Work at the Human-Technology Frontier**
- **Navigating the New Arctic**
- **Windows on the Universe: The Era of Multi-Messenger Astrophysics**
- **The Quantum Leap: Leading the Next Quantum Revolution**
- **Understanding the Rules of Life: Predicting Phenotype**
- **Mid-scale Research Infrastructure**
- **NSF 2026: Seeding Innovation**
- **Growing Convergence Research at NSF**
- **NSF INCLUDES (Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science): Enhancing STEM through Diversity and Inclusion**

Webinar and Events

Event: NJIT CS Seminar: Network Virtual and Augmented Reality: The New Frontier
Speaker: Dr. Jacob Chakareski, University of Alabama
When: October 4, 2018; 2.30 PM – 3.30 PM
Where: Central King Building (CKB) Room 116
Website: https://web.njit.edu/cs/CS_Seminar/
Abstract: Virtual and augmented reality (VR/AR) have the potential to advance our society. Presently limited to offline operation and synthetic content, and targeting gaming and entertainment, they are expected to reach their potential when deployed online and with real remote scene content. This will require novel holistic solutions that will push the frontiers in sensing, compression, networking, and machine learning,to overcome the considerable challenges ahead. My long-term research objective is UAV-IoT-deployed ubiquitous VR/AR immersive communication that can enable virtual human teleportation to any corner of the world. Thereby, we can achieve a broad range of technological and societal advances that will enhance energy conservation, quality of life, and the global economy. I am investigating fundamental problems at the intersection of signal acquisition and representation, communications and networking, (embedded) sensors and systems, and rigorous machine learning for stochastic control that arise in this context. I envision a future where UAV-IoT-deployed immersive communication systems will help break existing barriers in remote sensing, monitoring, localization and navigation, and scene understanding. The presentation will outline some of my present and envisioned investigations. Interdisciplinary applications will be highlighted.
About the speaker: Jacob Chakareski is an Assistant Professor of Electrical and Computer Engineering at The University of Alabama, where he leads the Laboratory for VR/AR Immersive Communication (LION). His interests span networked virtual and augmented reality systems, UAV-IoT sensing and communication, and rigorous machine learning for stochastic control. Dr. Chakareski received the Adobe Data Science Faculty Research Award (2017), a best paper award at the IEEE Int□l Conf. on Communications (ICC) 2017, and the Swiss NSF Career Award Ambizione. He is the organizer of the first NSF visioning workshop on networked VR/AR communications. He trained as a PhD student at Rice and Stanford, held research appointments with Microsoft, HP Labs, and EPFL, and sits on the advisory board of Frame, Inc. His research is supported by the NSF, AFOSR, Adobe, NVIDIA, and Microsoft. For further info, please visit www.jakov.org.

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Event: The Story of Two Metal-Catalyzed Reactions that Changed Organic Chemistry: NSF's Nobel Prize Role
Sponsor: NSF
When: October 15, 2018; 2.00 PM – 3.00 PM
Website: https://www.nsf.gov/events/event_summ.jsp?cntn_id=296732&org=NSF
Brief Description: Nearly half a century ago a forbidden reaction according to orbital symmetry rules was serendipitously discovered. In this process, two olefins (compounds with a carbon–carbon double bond) were converted into two new olefins in the presence of catalysts prepared from tungsten, molybdenum, or rhenium oxides supported on silica or alumina. This reaction known as metathesis is used in multimillion industrial processes in the petrochemical and pharmaceutical industries and for high-strength materials.

On paper the carbon-carbon double bonds (C=C) in the original olefins appeared to be *cleaved* and the halves *recombined* to give the new olefins. An analogous reaction for carbon-carbon *triple* bonds was discovered some years later. Several decades were required to unravel the related mechanisms for these olefin and acetylene metathesis reactions. This was done largely through the synthesis of new types of organometallic compounds and the synthesis and study of *homogeneous* catalysts for each reaction. Today a wide variety of reactions that cannot be achieved catalytically with traditional organic chemistry are based on carbon–carbon double or (to a lesser extent) triple bond metathesis reactions.
In this lecture Prof Schrock will discuss the important role that NSF played in the work that led to the 2005 Nobel Prize in Chemistry awarded to him, Yves Chauvin and Robert Grubbs for the elucidation of the mechanism in how this *change-your-partners dance* takes place and will show how many recalcitrant problems have since then been solved and research continues to attack those that remain in this ever-expanding field of organometallic/organic catalytic chemistry.
Type of Event: Lecture.

Event: Math Frontiers Monthly Webinar Series
Sponsor: National Academies
When: October 9, 2018 from 2.00 PM
Website: http://sites.nationalacademies.org/deps/bmsa/deps_183972
Brief Description: Join the National Academies of Sciences, Engineering, and Medicine for a webinar series on exciting and upcoming mathematics research across an array of topics. Webinars will take place on the **second Tuesday of each month from 2-3 p.m. ET,** with two speakers and live Q&A. See below for the list of dates and themes for each webinar. ***When registering, please make sure you select all the webinars you would like to attend.***

As each webinar approaches, we will post more information about the speakers on the webinar series page at nas.edu/mathfrontiers.

October 9, 2018: ***Combinatorics***

Invited speakers will discuss the mathematical study of discrete structures and their properties focusing on some of the modern techniques in the area including the probabilistic method. Application areas include information theory, statistical physics, molecular biology and computer science.

November 13, 2018: ***Why Machine Learning Works***

Invited speakers will discuss the mathematics behind machine learning and how they enable predictive analyses.

December 11, 2018: ***Mathematics of Epidemics***

Professors Calistus Ngonghala and Folashade B. Agusto will discuss mathematical approaches to studying biology, including ecology and infectious disease.

To join the webinar: Please register at http://sites.nationalacademies.org/deps/bmsa/deps_183972

Grant Opportunities

National Science Foundation

Grant Program: Enabling Early-Stage Secure and Trustworthy Cyberspace (SaTC) Socio-Technical Interdisciplinary Collaborations

Agency: National Science Foundation NSF 18-600

RFP Website: https://www.nsf.gov/pubs/2018/nsf18600/nsf18600.htm

Brief Description: The National Science Foundation's (NSF) Secure and Trustworthy Cyberspace (SaTC) program aims to promote research on the fundamentals of security and privacy as a multidisciplinary subject that will lead to new ways to design, build, and operate cyber systems, protect existing infrastructure, and motivate and educate individuals about cybersecurity. With this DCL, NSF is announcing its intention to encourage the submission of EArly-Concept Grants for Exploratory Research (EAGER) proposals that foster excellent interdisciplinary research in the SaTC domain to be carried out in early-stage collaborations between one or more Computer and Information Science and Engineering (CISE) researchers and one or more Social, Behavioral, and Economic Sciences (SBE) researchers. Note that this DCL is focused on collaborations of principal investigators (PIs) who have not previously jointly received a SaTC award.

Many scientific and practical challenges of security, privacy, and trust have sociotechnical dimensions, making it important to encourage interdisciplinary collaborations among researchers from the disciplines represented in NSF's CISE and SBE directorates on topics that draw on the strengths of each researcher. Some of these topics are suggested in the most recent SaTC program solicitation (NSF 18-572), but other topics relevant to the SaTC program are also welcome.

Awards: Standard Grants. NSF anticipates funding up to 10 EAGER awards pursuant to this DCL, subject to the availability of funds and quality of proposals received.

Letter of Intent: Not Required

Proposal Submission Deadline: December 12, 2018

Contacts: Sara Kiesler (skiesler@nsf.gov)
Dan Cosley (dcosley@nsf.gov)
Susanne Wetzel (swetzel@nsf.gov)

Grant Program: Understanding the Rules of Life: Epigenetics
Agency: National Science Foundation NSF 18-600
RFP Website: https://www.nsf.gov/pubs/2018/nsf18600/nsf18600.htm
Brief Description: *Understanding the Rules of Life (URoL): Predicting Phenotype* is one of NSF's 10 Big Ideas and is focused on predicting the set of observable characteristics (phenotype) from the genetic makeup of the individual and the nature of its environment. The development of new research tools has revolutionized our ability to manipulate and investigate the genome and to measure multiple aspects of biological, physical, and social environments. The opportunity now is to assimilate this new information into causal, mechanistic, and/or predictive relationships between the genomic and epigenetic makeup, the environmental experience, and the phenotypic characteristics of biological systems. These relationships are the basis for the Rules of Life – the theoretical constructs that explain and predict the characteristics of living systems, from molecular and sub-cellular components, to cells, whole organisms, communities and biomes.

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

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

The URoL:Epigenetics Program offers two submission tracks: Track 1 - for projects with a total budget of up to $500,000 and an award duration of up to 3 years, and Track 2 - for projects with a total budget of up to $3,000,000 and award duration of up to 5 years.
Awards: Standard Grant; Available Funds; $18,000,000
Letter of Intent: Not Required
Proposal Submission Deadline: February 01, 2019
Contacts: Mitra Basu, telephone: 703-292-8649, email: epigen@nsf.gov

- Rebecca Ferrell, telephone: 703-292-7850, email: epigen@nsf.gov
- Louise R. Howe, telephone: 703-292-2548, email: epigen@nsf.gov

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Grant Program: Understanding the Rules of Life: Building a Synthetic Cell: An Ideas Lab Activity
Agency: National Science Foundation NSF 18-599
RFP Website: https://www.nsf.gov/pubs/2018/nsf18599/nsf18599.htm
Brief Description: This solicitation describes an Ideas Lab on "Building a Synthetic Cell." Ideas Labs are intensive workshops focused on finding innovative solutions to grand challenge problems. The ultimate aim of this Ideas Lab organized by the National Science Foundation is to facilitate the generation and execution of innovative research projects aimed at designing, fabricating, and validating synthetic cells that express specified phenotypes. The aspiration is that mixing researchers who have diverse

scientific backgrounds will engender original thinking and innovative approaches that will transform our understanding of cellular processes, the molecular mechanisms that underscore the building and function of systems that reproduce life traits, the self-assembly of life-like systems, soft condensed matter, and the physics and chemistry of life that are needed to design and build cellular components, cells and multicell systems.

The ability to design and manufacture synthetic cells has significant implications for the scientific and economic enterprise of the United States. The synthesis of viable cells from non-living molecules and materials can open the door to the production of functional biomaterials and improved biofuels, large scale chemical synthesis, non-silicon-based computing, novel soil engineering, and medical and pharmaceutical advances, to name just a few possibilities. The study of synthetic cells, and of the processes used in their creation, can also provide a window on the origin and evolution of life on Earth and, potentially, provide insight into extraterrestrial life.

Synthetic cells have a number of shared characteristics. They may possess many of the structures of biological cells and reproduce capabilities such as self-replication, metabolism and response to environmental cues. However, they may be engineered using novel molecules and materials and structures to mimic single or complex biological functions. There are many reasons to engage in synthetic cell research; for example, to better understand what constitutes a living system, to identify the truly essential functions of cells, and building in itself can be a way to demonstrate understanding. Synthetic cell research employs a wide range of approaches including 'top down' methodologies exemplified by efforts to construct a 'minimal cell' by gradually deleting genes and components until a system with the fewest components that still exhibits the hallmarks of life is obtained. The alternative 'bottom up' approaches involve assembling molecular building blocks until cellular functions are obtained. These approaches might meet in the middle, and may inform each other.

The design and production of synthetic cells requires the development of innovative and integrative experimental approaches in combination with novel theoretical frameworks, improved mathematical models, new artificial biomaterials, predictive understanding of biological function, and the identification of causal relationships in biological systems (e.g. genotype/phenotype, structure/function), all within an ethical framework that is sensitive to the profound implications of the research being conducted. Building a synthetic cell is a grand challenge at the interface between biological, mathematical, computer and physical sciences and engineering that has the potential to advance not only applications, but also our fundamental understanding of how cells self-assemble and function and of emergent order in non-equilibrium systems. Meeting this challenge requires simultaneous careful exploration of the social and ethical dimensions of such research as well as educating today's students to engage in the activities and technologies required both for developing synthetic cells and for their use in biology, engineering, chemistry, pharmaceutical development, and other activities. Only by doing so will we be able to fully understand both the societal benefits and risks as well as their potential for willful misuse or unintended damage to natural biological systems. In concert with technology development, educating students and the lay public will also be important to ensure an accurate understanding of the scientific advances resulting from the development and use of synthetic cells.

This Ideas Lab advances the objectives of one of *10 Big Ideas for Future NSF Investments*: 'Understanding the Rules of Life: Predicting Phenotype'. The 10 Big Ideas will push forward the frontiers of U.S. research and provide innovative approaches to solve some of the most pressing problems the world faces, as well as lead to discoveries not yet known. This multi-directorate program is one element of NSF's multi-year effort towards the goals of the Understanding the Rules of Life Big Idea (https://www.nsf.gov/news/special_reports/big_ideas/life.jsp). US researchers may submit preliminary proposals only *via* FastLane for participation in the Ideas Lab in which a set of multidisciplinary ideas will be developed. These multidisciplinary ideas will form the basis of the full proposals to be written based on the discussion within the Ideas Lab.

Awards: Standard Grant; Available Funds; $10,000,000

Letter of Intent: Not Required
Preliminary Proposal Due Date(s) *(required)*: December 28, 2018
Full Proposal Deadline(s) (due by 5 p.m. submitter's local time): May 13, 2019
Proposal Submission Deadline: December 18, 2018
Contacts: Charles Cunningham, telephone: (703) 292-2283, email: chacunni@nsf.gov

- Mitra Basu, telephone: (703) 292-8649, email: mbasu@nsf.gov
- Krastan B. Blagoev, telephone: (703) 292-4666, email: kblagoev@nsf.gov

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Grant Program: Big Data Regional Innovation Hubs (BD Hubs) Accelerating the Big Data Innovation Ecosystem
Agency: National Science Foundation NSF 18-598
RFP Website: https://www.nsf.gov/pubs/2018/nsf18598/nsf18598.htm
Brief Description: NSF's Directorate for Computer and Information Science and Engineering (CISE) initiated the National Network of Big Data Regional Innovation Hubs (BD Hubs) program in FY 2015 (NSF 15-562). Four Big Data Hubs (BD Hubs)—*Midwest*, *Northeast*, *South,* and *West*—were established, one in each of the four Census Regions of the United States[1]. The BD Hubs provide the ability to engage local or regional stakeholders, e.g., city, county, and state governments, local industry and non-profits, and regional academic institutions, in big data research, and permit a focus on regional issues. These collaborative activities and partnerships play a critical role in building and sustaining a successful national big data innovation ecosystem.

This solicitation continues the operation of a national network of BD Hubs. It builds on demonstrated strengths of the program, which has grown to include a set of BD Spokes affiliated with the BD Hubs, and is responsive to the recent developments in data science. For instance, the recently released report on Data Science for Undergraduates: Opportunities and Options from the National Academies of Sciences, Engineering, and Medicine exemplifies the urgency of multi-faceted education and training in data science. The BD Hubs will continue to nucleate regional collaborations and multi-sector projects, while fostering innovation in data science.

The NSF BD Hubs program is aligned with NSF's Harnessing the Data Revolution (HDR) Big Idea, one of NSF's 10 Big Ideas for Future Investment. HDR is a visionary, national-scale activity to enable new modes of data-driven discovery, allowing fundamentally new questions to be asked and answered in science and engineering frontiers, generating new knowledge and understanding, and accelerating discovery and innovation. The HDR vision is realized via a coordinated set of program solicitations resulting in an ecosystem of interrelated activities enabling (i) research in the foundations of data science; frameworks, algorithms, and systems for data science; and data-driven research in science and engineering; (ii) advanced cyberinfrastructure; and (iii) education and workforce development—all of which are designed to amplify the intrinsically multidisciplinary nature of the data science challenge. The HDR Big Idea will establish theoretical, technical, and ethical data science frameworks, and apply them to practical problems in science and engineering, and in society more generally.
Awards: Up to $4,000,000; Available Funds; $16,000,000
Letter of Intent: Not Required
Limit on Number of Proposals per Organization: 1: An organization may only submit one proposal.
Limit on Number of Proposals per PI or Co-PI: 1
Internal Competition: NJIT faculty should send SVPR Atam Dhawan a pre-proposal with the following sections for internal review by October 15, 2018. The selection of the proposal for institutional submission will be announced by October 22, 2018. The pre-proposal should include:

i. A cover sheet with names and affiliation of all investigators
ii. Summary of the project with Intellectual Merit and Broader Impact sections

iii. Proposed budget
iv. NSF format biographical sketch for PI and all Co-PIs.

Full Proposal Submission Deadline: December 18, 2018

Contacts: Beth A. Plale, Science Advisor, CISE/OAC, National Science Foundation, E10475, telephone: (703) 292-7004, email: BDHubQueries@nsf.gov

Alejandro M. Suarez, Assistant Program Director, CISE/OAC, National Science Foundation, E10457, telephone: (703) 292-7092, email: BDHubQueries@nsf.gov

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Grant Program: Formal Methods in the Field (FMitF)

Agency: National Science Foundation NSF 18-596

RFP Website: https://www.nsf.gov/pubs/2018/nsf18596/nsf18596.htm

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

The FMitF program solicits two classes of proposals:

- **Track I: Research proposals:** Each proposal must have at least one Principal Investigator (PI) or co-PI with expertise in formal methods and at least one with expertise in one or more of these fields: computer networks, cyber-human systems, distributed/operating systems, hybrid/dynamical systems, and machine learning. Proposals are expected to address the fundamental contributions to both formal methods and the respective field(s) and should include a proof of concept in the field along with a detailed evaluation plan that discusses intended scope of applicability, trade-offs, and limitations. All proposals are expected to contain a detailed collaboration plan that clearly highlights and justifies the complementary expertise of the PIs/co-PIs in the designated areas and describes the mechanisms for continuous bi-directional interaction. Projects are limited to $750,000 in total budget, with durations of up to four years.
- **Track II: Transition to Practice (TTP) proposals:** The objective of this track is to support the ongoing development of extensible and robust formal methods research prototypes/tools to facilitate usability and accessibility to a larger and more diverse community of users. These proposals are expected to support the development, implementation, and deployment of later-stage successful formal methods research and tools into operational environments in order to bridge the gap between research and practice. A TTP proposal must include a project plan that addresses major tasks and system development milestones as well as an evaluation plan for the working system. Proposals are expected to identify a target user community or organization that will serve as an early adopter of the technology. Collaborations with industry are strongly encouraged. Projects are limited to $100,000 in total budget, with durations of up to 18 months.

The Project Description can be **up to 15 pages for Track I proposals**, and **up to 7 pages for the Track II proposals**.
Awards: Standard Grant **Anticipated Funding Amount:** $10,000,000
Letter of Intent: Not Required
Full Proposal Submission Deadline: January 15, 2019
Contacts: Nina Amla, Program Director, CISE/CCF, telephone: (703) 292-7991, email: namla@nsf.gov

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

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Grant Program: Cyberinfrastructure for Biological Research (CIBR)
Agency: National Science Foundation NSF PD 18-1165
RFP Website:
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505538&org=NSF&sel_org=NSF&from=fund
Brief Description: Biological processes at all scales from molecules to ecosystems are determined through the encoding, exchange, and interpretation of information. Advances in the biological sciences are enabled by our capacity to acquire, manage, represent, and analyze biological information through the use of modern instrumentation and computational tools. Developing an integrated understanding of cell function, regulatory systems, or ecological responses to environmental change are just a few examples of biological research areas that involve the acquisition, observation, experiment, and modeling of large amounts of data. Proposals are invited that offer potentially transformative outcomes through the development of informatics tools and resources that (1) offer novel and significant advances in the use of biological data and/or (2) will enable and stimulate advances through their impact on a significant segment of the biological research community supported by the NSF BIO Directorate. CIBR supports development in areas that may include (but are not limited to):

- Databases consisting of primary data obtained through observation, experimentation, modelling, or synthesis of existing data into new derivative products.
- New tools for the construction, operation, and utilization of biological databases, including database architectures and infrastructures, data standards designed to be extendable to different biological domains, and data structures for new types of biological information
- Software or ontologies related to the retrieval, integration, and use of heterogeneous biological information, for example, data discovery, data-mining, data integration or visualization
- Tools that facilitate biological research workflows, analytic pathways, or integration between the field and the laboratory, or between observation, experiments and models
- Software and methods for making use of new technologies for the acquisition, communication or visualization of biological data
- Infrastructure that provides broad community access to shared computational and data resources, commonly referred to as scientific gateways.

Awards: Standard Grants
Letter of Intent: Not Required
Full Proposal Submission Deadline: Anytime
Contacts: Peter H. McCartney pmccartn@nsf.gov (703) 292-8470
Jennifer W. Weller jweller@nsf.gov (703) 292-7121

Grant Program: Infrastructure Innovation for Biological Research (IIBR)
Agency: National Science Foundation NSF 18-595

RFP Website: https://www.nsf.gov/pubs/2018/nsf18595/nsf18595.htm
Brief Description: The Infrastructure Innovation for Biological Research (IIBR) solicitation supports new and innovative research in biological informatics, instrumentation and associated methods, as well as multidisciplinary approaches to these broad themes that address needs in basic biological research. These awards support pioneering approaches that develop de novo infrastructure, significantly redesign existing infrastructure, or apply existing infrastructure in novel ways. Activities must demonstrate the potential to advance or transform research in biology as supported by the Directorate for Biological Sciences at the National Science Foundation (https://nsf.gov/bio).
Awards: Standard Grant **Anticipated Funding Amount:** $10,000,000
Letter of Intent: Not Required
Full Proposal Submission Deadline: Anytime
Contacts: Robert Fleischmann, telephone: (703) 292-7191, email: rfleisch@nsf.gov

- Steve Ellis, telephone: (703) 292-7876, email: stellis@nsf.gov
- Jennifer W. Weller, telephone: (703) 292-7121, email: jweller@nsf.g

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Grant Program: Infrastructure Capacity for Biology (ICB) Core Programs
Agency: National Science Foundation NSF 18-594
RFP Website: https://www.nsf.gov/pubs/2018/nsf18594/nsf18594.htm
Brief Description: The Infrastructure Capacity for Biology (ICB) supports the development, expansion, or improvement of infrastructure that will enable fundamental research within the biological sciences. Infrastructure supported under this solicitation may include cyberinfrastructure, instrumentation, biological collections, living stocks, field stations, marine labs, or other resources that are shared and openly accessible. Proposals submitted to the ICB solicitation must make a compelling case that the proposed infrastructure will advance or transform research in areas of science that are supported by the Directorate for Biological Sciences (BIO) at the National Science Foundation.

While other programs in the Division of Biological Infrastructure (DBI) focus on innovative research leading to new infrastructure or sustained operation of mature infrastructure, this solicitation focuses on supporting projects that seek to deliver, enable access to, or substantially improve infrastructure that will advance the capacity of today's scientific community to conduct leading edge research. The impacts of the activities funded by awards made through this solicitation will be reflected not just in the quality of their products, but by the novel and transformative science outcomes that will be achieved by the users of these resources. Infrastructure projects that will advance any field of research supported by the Directorate for Biological Sciences are eligible for support under this program.
Awards: Standard Grant **Anticipated Funding Amount:** $40,000,000
Letter of Intent: Not Required
Full Proposal Submission Deadline: Anytime

- **Contacts:** Peter H. McCartney, telephone: (703) 292-8470, email: pmccartn@nsf.gov
- Robert D. Fleischmann, telephone: (703) 292-7191, email: rfleisch@nsf.gov
- Reed S. Beaman, telephone: (703) 292-7163, email: rsbeaman@nsf.gov

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National Institutes of Health

Grant Program: BRAIN Initiative Cell Census Network (BICCN) ? Scalable Technologies and Tools for Brain Cell Census (R01 Clinical Trial Not Allowed)
Agency: National Institutes of Health RFA-MH-19-148
RFP Website: https://grants.nih.gov/grants/guide/rfa-files/RFA-MH-19-148.html

Brief Description: The BRAIN Initiative Cell Census program awarded 9 collaborative projects in 2017 and 5 in 2018 under four companion FOAs (RFA-MH-17-210, -215, -225, and -230), which collectively constitute the BRAIN Cell Census Network (BICCN). The overarching goal of the BICCN is to generate comprehensive 3D common reference brain cell atlases that will integrate molecular, anatomical, functional, and cell lineage data for describing cell types in mouse, human, and non-human primate brains. The expected outcomes of the BICCN include:

- fundamental knowledge on diverse cell types and their three dimensional organizational logic in the brain;
- an open-access 3D digital brain cell reference atlas with molecular, anatomical, and physiological annotations of brain cell types in mouse;
- a comprehensive neural circuit diagram in mouse brain;
- reagents for cell-specific targeting;
- validated high throughput and low-cost approaches to characterizing cell diversity in human and/or non-human primate brain samples.

The BICCN operates as a cooperative network to promote collaboration and coordination among the projects within the Network and the BRAIN Initiative, as well as with any external research entities that have similar goals. Currently the BICCN has established close collaboration and coordination relationship with Data Archive projects funded under RFA-MH-17-255. It is expected that the BICCN awardees and their collaborators will work together to achieve the common goals. This will involve regular meetings and other coordinated activities within the BICCN as well as in the BRAIN Initiative and more broadly with the research and education communities. Thus, the BICCN will leverage existing atlases and common coordinate systems to facilitate collaborative efforts for the data annotation and 3D spatial mapping.
Award: Application budgets are not limited but need to reflect the actual needs of the proposed project.
Letter of Intent: December 22, 2018 and December 24, 2019
Deadline: January 22, 2019 and January 24, 2020, by 5:00 PM local time of applicant organization. All types of non-AIDS applications allowed for this funding opportunity announcement are due on these dates. Applicants are encouraged to apply early to allow adequate time to make any corrections to errors found in the application during the submission process by the due date.

Grant Program: NIH Blueprint Program for Enhancing Neuroscience Diversity through Undergraduate Research Education Experiences (R25 Clinical Trial Not Allowed)
Agency: National Institutes of Health RFA-NS-19-007
RFP Website: https://grants.nih.gov/grants/guide/rfa-files/RFA-NS-19-007.html
Brief Description: The overarching objective of this funding opportunity is to encourage individuals from diverse backgrounds, including those from groups underrepresented in the biomedical, behavioral, and clinical research workforce, to pursue further studies or careers in. To achieve this goal, the initiative will support neuroscience research education programs comprised of year-round authentic neuroscience research experiences, research and career development, and establishment of professional networks, implemented through collaborative partnerships integrated across different educational institution types. Proposed program interventions in response to this FOA should focus on asset models and leadership opportunities, rather than solely deficit models and remediation (recommendations from 2017 NINDS Activating a Neural Network and 2016 NINDS Forming a Neural Network Workshops).
Participating components of the collaborative research education partnerships should include:

- **One or more institutions** that either: 1) have a historical and current mission to educate students from any of the populations that have been identified as underrepresented in biomedical research as defined by the National Science Foundation NSF, see http://www.nsf.gov/statistics/wmpd/) (i.e., African Americans or Blacks, Hispanic or

Latino Americans, American Indians, Alaska Natives, Native Hawaiians, U.S. Pacific Islanders, and persons with disabilities) or 2) have a documented track record of recruiting, training and/or educating, and graduating underrepresented students as defined by NSF (see above), which has resulted in increasing the institution's contribution to the national pool of graduates from underrepresented backgrounds who pursue biomedical research careers;

- A research-intensive institution, defined as having an existing neuroscience or neuroscience-related program and a significant number of potential mentors with NIH R01 or equivalent extramural research support;
- Formal alliances with one or more institutions with neuroscience-focused graduate research training programs that can provide summer research experiences for participating ENDURE students. Such institutions may hold NIH T32 research training grants, including T32 programs supported by the NIH Jointly Sponsored Institutional Predoctoral Training Programs in the Neurosciences (https://researchtraining.nih.gov/JSPTPN). Additional relevant neuroscience programs can be found by using the NIH RePORTER tool (http://projectreporter.nih.gov/reporter.cfm). These alliances are expected to actively facilitate early communication and interaction among participating students and NIH neuroscience predoctoral program training directors.

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

- ***Research Experiences:*** The program must include part-time authentic neuroscience research experiences in extramurally-funded laboratories during the academic year at the home institution or one of the partnering institutions.There must also be full-time summer neuroscience research experiences in laboratories that are part of a neuroscience-focused graduate research training program, such as an NIH Institutional Research Training predoctoral program (T32), and which may be located on or off-site of the partnering institutions. The academic year and summer research training experiences across applicant institutions must be carefully monitored. Regularly-scheduled internal review and assessment should be made regarding the progressive scientific skill sets being developed through the research education experiences, the type of mentoring and supervision students are receiving, and the monitoring and evaluation plans for both the students and research mentors. Specific measurable research education and research training objectives are to be determined by the applicant institutions. Examples of measurable objectives include: number of students matriculating through the research education programs and admitted to graduate programs in the neurosciences; improvement in students' quantitative skills and academic achievement; and improvement in scientific writing and presentation skills.
- ***Mentoring Activities:*** Programs must provide students with outstanding mentoring and education in other critical skills such as leadership, grant and manuscript writing, and time management. There should be dedicated efforts at providing not only technical expertise, but advice, insight, and professional career skills to students in the program.
- NIH realizes that quality mentorship is critical to the recruitment and retention of scientists, including those from underrepresented backgrounds, and encourages program activities to improve the caliber of mentorship. As recommended in the 2018 NASEM report on graduate education, "modules for faculty to learn how to advise and mentor students from different backgrounds and to raise awareness and accountability about their role in changing the training and mentoring environment" should be a component of a well designed program. For example, case-based scenarios may be used to educate mentors on various relevant ethical, professional and cultural issues facing students today, effective

communication and mentoring compacts, and effective tools for mentors to address cultural awareness.

- ***Courses for Skills Development:*** Courses should be integrated across the partnering institutions and uniquely designed to increase students' interest in and preparation to enter Ph.D. degree programs in the neurosciences. Depending on the strength of the applicant institution, it is expected that academic and curriculum enhancement activities may vary in how they are formalized and integrated; various strategies, rooted in education research, may be utilized. These approaches may include, but are not limited to: core neuroscience coursework tailored to students' backgrounds and needs; development of interdisciplinary or advanced courses with focus on inquiry-based learning or critical thinking and development of experimental rigor and quantitative skills to address neuroscience problems (as recommended in Developing a 21st Century Neuroscience Workforce); curriculum for specialized research techniques; collaborative learning experiences and group activities to convey the excitement and relevance of neuroscience to students; advisement regarding the number, level, and sequence of math and science courses that students should take to be competitive for graduate school programs in the neurosciences; seminars emphasizing scientific reading comprehension, writing, and oral presentation skills; and research career seminars to help prepare students for the transition from undergraduate to graduate school.

Award: Although the size of award may vary with the scope of the research education program proposed and there are no specific budget limitations, the requested direct costs must be reasonable, well documented, fully justified and commensurate with the scope of the proposed program.
Letter of Intent: January 15, 2019
Deadline: February 15, 2019, by 5:00 PM local time of applicant organization. All types of non-AIDS applications allowed for this funding opportunity announcement are due on these dates.
Applicants are encouraged to apply early to allow adequate time to make any corrections to errors found in the application during the submission process by the due date.

Grant Program: Imaging - Science Track Award for Research Transition (I/START) (R03 Clinical Trial Optional)
Agency: National Institutes of Health PAR-18-918
RFP Website: https://grants.nih.gov/grants/guide/pa-files/PAR-18-918.html
Brief Description: The goal of this Funding Opportunity Announcement (FOA) is to facilitate the entry of investigators to the area of brain imaging research, including both new investigators and established investigators seeking to add brain imaging to their research programs. Accordingly, this FOA invites applications for the Imaging - Science Track Award for Research Transition (I/START) program, a continuing program developed by NIDA to foster the entry of investigators into the areas of brain imaging and drug abuse research. The application of brain imaging technology that can be used in humans is becoming more widespread; however, it is often difficult for new investigators or even established investigators wishing to incorporate such brain imaging methods in their research program to obtain independent funding to generate preliminary data in this area or for more established investigators to identify a source of funding that would allow them to explore the potential application of imaging to their research. In many research domains, investigators are often able to identify sources of support sufficient to conduct preliminary studies. In contrast, the cost of obtaining preliminary data using brain imaging methods that can be used in humans (e.g., PET and MRI scans) often serves as a significant barrier to research, particularly for more translational efforts. This FOA will allow for study design and collection of "proof of concept" brain imaging data that can then be used as pilot data for the transition to more extensive research applications.

Award: Application budgets are not limited but need to reflect the actual needs of the proposed project.
Letter of Intent: Not required
Deadline: Standard dates apply , by 5:00 PM local time of applicant organization. All types of non-AIDS applications allowed for this funding opportunity announcement are due on these dates.
Applicants are encouraged to apply early to allow adequate time to make any corrections to errors found in the application during the submission process by the due date.

Grant Program: BRAIN Initiative: Team-Research BRAIN Circuit Programs - TeamBCP (U19 Clinical Trial Not Allowed)
Agency: National Institutes of Health RFA-NS-19-003
RFP Website: https://grants.nih.gov/grants/guide/rfa-files/RFA-NS-19-003.html
Brief Description: Awards within this RFA will support research programs with 2-5 Research Projects focused on a high impact topic and cutting-edge technologies in large-scale recording and manipulation of circuits in vivo in the context of measurable behaviors. These research teams should offer resources and governance that bridge across institutional 'silos.' For example, research teams might comprise components across institutions or across colleges within a university. Projects should investigate neural function related to defined, ethologically relevant behaviors, well-defined neural systems, and/or biological mechanisms at an anatomic resolution of cells and circuits, and at a sub-second temporal resolution. We expect that awarded projects will become part of a consortium among BRAIN Initiative awardees in developing technologies, methods, expertise, and data and tools for sharing and reuse within the research community. There will be annual reviews by an External Advisory Board per award, with expanded programmatic site visits during years 2 and 4.
The proposed studies must relate to at least one of the seven major topic areas of the BRAIN 2025 report:
1. Discovering diversity: Identify and provide experimental access to the different cell types to determine their roles in the context of circuit function.
2. Maps at multiple scales: Generate structural and functional circuit diagrams that can span resolution from synapses to the whole brain.
3. The brain in action: Produce a dynamic picture of the functioning brain by developing and applying improved methods for large-scale monitoring of neural activity.
4. Demonstrating causality: Link brain activity to behavior with precise interventional tools that change neural circuit dynamics.
5. Identifying fundamental principles: Produce conceptual foundations about circuit dynamics and functional connectivity for understanding the biological basis of mental processes through development of new theoretical and data analysis tools.
6. Advancing human neuroscience: Develop innovative technologies to understand brain circuits and ensembles of circuits that inform understanding of the human brain and mechanisms for treating its disorders.
7. From BRAIN Initiative to the brain: Integrate new technological and conceptual approaches produced in Goals #1-6 to discover how dynamic patterns of neural activity are transformed into cognition, emotion, perception, and action in health and disease.
Award: Application budgets are not limited but need to reflect the actual needs of the proposed project.
Letter of Intent: September 30, 2018
Deadline: October 30, 2018 by 5:00 PM local time of applicant organization. All types of non-AIDS applications allowed for this funding opportunity announcement are due on these dates.
Applicants are encouraged to apply early to allow adequate time to make any corrections to errors found in the application during the submission process by the due date.

Grant Program: BRAIN Initiative: Research Opportunities Using Invasive Neural Recording and Stimulating Technologies in the Human Brain (U01 Clinical Trial Required)
Agency: National Institutes of Health RFA-NS-19-001
RFP Website: https://grants.nih.gov/grants/guide/rfa-files/RFA-NS-19-001.html
Brief Description: Investigations within the human brain offer revolutionary, but challenging, opportunities for experimental investigation of how the human brain senses, thinks, perceives, remembers, plans, registers emotions, activates movements, and makes decisions. Invasive surgical procedures provide the unique ability to record and stimulate neurons within precisely localized brain structures in humans. However, human studies using invasive technology are often constrained by a limited number of patients and resources available to implement complex experimental protocols and are rarely aggregated in a manner that addresses research questions with appropriate statistical power. Therefore, this RFA seeks applications to assemble diverse, integrated, multi-disciplinary teams that cross boundaries of interdisciplinary collaboration to overcome these fundamental barriers and to investigate high-impact questions in human neuroscience. Projects should propose prospective testing and validation of explicit or model-driven hypotheses. Studies that offer deployment or development for high temporal resolution of behavioral quantification integrated with invasive recording of brain activity is encouraged, especially those that would transition to use in naturalistic environments outside of strict laboratory settings.

Projects should engage diverse, multidisciplinary teams consisting of clinicians, scientists, device engineers, data/computational scientists, regulatory specialists, and/or ethics specialists. Teams may be assembled within a single institution, but because of the likelihood of a limited number of patients at any single research center, integration of research teams across sites is strongly encouraged.

Awardees are expected to actively participate in a consortium work group, coordinated by the NIH, to identify consensus standards of practice, including neuroethical considerations, to collect and provide data for ancillary studies, and to aggregate and standardize data for dissemination among the wider scientific community. In the interest of iterative models of discovery, support for complementary animal studies are allowed if they validate or inform these empirical studies of human physiology. Applicants are expected to employ approaches guided by specified theoretical constructs, and are encouraged to employ quantitative, mechanistic models where appropriate.

We anticipate that implantable devices for most of these applications will rely on existing technology sufficiently advanced for an IRB Non-Significant Risk designation, or an FDA IDE without needing significant additional pre-clinical testing on the device. We also anticipate that newly IDE-approved devices may become available over the course of these awards. NIH BRAIN is supporting new device development and regulatory approval through other NIH BRAIN initiatives, including the availability of template Memoranda of Agreements (MOUs), Confidential Disclosure Agreements (CDAs) and Collaborative Research Agreements (CRAs) with various private and commercial device providers that may facilitate awardees to adopt novel technologies to fit their needs (see http://braininitiative.nih.gov/ for up to date information and NIH Scientific/Research contacts). Where appropriate, applicants are encouraged to anticipate potential and alternative plans for adopting newly available technologies. Furthermore, use of the cooperative agreement mechanism will allow awardees to negotiate the incorporation of new technologies by working through NIH Program staff in collaboration with technology providers.

Awards: Application budgets are not limited but need to reflect the actual needs of the proposed project.
Letter of Intent: October 14, 2018
Deadline: November 14, 2018 by 5:00 PM local time of applicant organization. All types of non-AIDS applications allowed for this funding opport unity announcement are due on these dates.
Applicants are encouraged to apply early to allow adequate time to make any corrections to errors found in the application during the submission process by the due date.

Department of Defense/US Army/DARPA/ONR

Grant Program: Microsystems Technology Office (MTO)
Agency: Department of Defense DARPA HR001118S0060
Website:
https://www.fbo.gov/index?s=opportunity&mode=form&id=68dfd959363ffdeb96f61c065e212ef7&tab=core&_cview=1
Brief Description: Since its inception in 1991, MTO has helped create and prevent strategic surprise through investments in compact microelectronic components such as microprocessors, microelectromechanical systems (MEMS), and photonic devices. MTO's revolutionary work applying advanced capabilities in areas such as wide-band gap materials, phased array radars, high-energy lasers, and infrared imaging have helped the United States establish and maintain technological superiority for more than two decades. MTO seeks to develop high-risk, high-reward technologies that continue DARPA's mission of creating and preventing strategic surprise, help to secure the Department of Defense's (DoD) technological superiority, and address the complex threats facing U.S. national security. Proposed research should investigate innovative approaches that enable revolutionary advances in science, devices, or systems. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice. As MTO evolves to address future microsystems-related challenges, the office has identified three target thrust areas: (1) Electronics: Managing Moore's Inflection, (2) Spectrum: Enhancing Our Advantage with Agility and Autonomy, and (3) Sensors: Decentralized Sensors for the DoD.
Awards: Multiple
Proposal Deadline:
Abstract Due Date: Abstracts may be submitted on a rolling basis until 1:00PM on May 26, 2020. o Proposal Due Date: Proposals may be submitted on a rolling basis until 1:00PM on June 26, 2020.
Contact Information: Dr. William Chappell Director, Microsystems Technology Office BAA Coordinator: HR001118S0060@darpa.mil

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Grant Program: AFRL/RXC Structural Materials Open BAA
Agency: Department of Defense Air Force -- Research Lab FA8650-18-S-5010
Website: http://cdmrp.army.mil/funding/dmrdp
Brief Description: Air Force Research Laboratory, Materials & Manufacturing Directorate, Structural Materials Division, AFRL/RXC, is soliciting white papers and potentially technical and cost proposals under this announcement that support the needs of its Structural Materials and Applications mission. Structural Materials technologies that range from materials and scientific discovery through technology development and transition are of interest. Descriptors of Materials and Manufacturing Directorate technology interests are presented in two contexts in the Statement of Objectives (BAA Attachment 1); that of structural materials science and engineering academic "competencies," and that of Air Force application area needs.
Awards: Up to $5,000,000; Available program funding: $99,500,000
Proposal Deadline:
White Paper Submission: 20 September 2023
Proposal Submission: Due followed by white paper submission and review
Contact Information: Adrianna Menker Contracting/Grants Officer Phone 937-713-9924

Grant Program: Information Innovation Office (I2O) Office-wide

Agency: Department of Defense DARPA HR001118S0057
Website:
https://www.fbo.gov/index?s=opportunity&mode=form&id=231c6de648bed959a18d8a439f1f32dd&tab=core&_cview=1
Brief Description: Modern society depends on information and information depends on information systems. Timely, insightful, reliable, and relevant information is essential, particularly for national security. The Information Innovation Office (I2O) sponsors basic and applied research in three thrust areas to ensure information advantage for the U.S. and its allies:

- **Symbiosis.** I2O envisions a future in which machines are more than just tools that execute human-programmed rules or generalize from human-curated data sets: rather, machines will become partners in problem solving. Enabling computing systems in this manner is of critical importance because sensor, information, and communication systems generate data at rates far beyond what humans can assimilate and understand for enabling effective action. Incorporating these technologies into military systems that collaborate with warfighters will facilitate better decisions in complex, time-critical, battlefield environments; enable a shared understanding of massive, incomplete, and contradictory information; and enable unmanned systems collaborating with human warfighters to perform missions safely and with higher degrees of autonomy.
- **Analytics.** The human domain is an increasingly important aspect of military strategy. What has changed is the capability to interact with populations on a global scale through the connectedness provided by the Internet, social media and other information ecosystems. We need analytical tools and technologies that rapidly transform the data and information in these ecosystems into effective courses of action for conflict resolution, stabilization, and other complex challenges. These tools and technologies enable an emerging data-centric paradigm: collect/curate data emphasizing the human domain but inclusive of all other domains; analyze data for entities, relationships, and trends; synthesize models for situational awareness, prediction, and intervention; and engage allies, stakeholders, and adversaries through appropriate channels.
- **Cyber.** Direct cyber threats against our information systems have grown in sophistication and number. Adversaries have at their disposal a growing diversity of means (including advanced persistent threats, botnets, denial of service attacks, and other sophisticated capabilities) with which to threaten critical infrastructure, embedded computing systems, cyber-physical systems, and enterprise information systems. The information and operational technology used in networks and systems must operate through a cyber-attack or enable rapid recovery from such an attack. Subtle or overt escalations of cyber conflict intensity and adversary attacks must be detected, understood, and attributed in a timely fashion. The U.S. must have the ability to mount an accurate, timely, effective, and appropriately-scaled cyber response to any cyber-attack, a response that is calibrated to discourage further escalation.

Awards: Multiple awards are anticipated. The level of funding for individual awards made under this solicitation has not been predetermined and will depend on the quality of the proposals received and the availability of funds.
Proposal Deadline: Abstract Due Date: July 18, 2019, 12:00 noon (ET) o Proposal Due Date: August 30, 2019, 12:00 noon (ET)
Contact Information: BAA Coordinator, DARPA/I2O • BAA Email: HR001118S0057@darpa.mil

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Grant Program: BROAD AGENCY ANNOUNCEMENT (BAA) for Extramural Biomedical Research and Development
Agency: Department of Defense Dept. of the Army – USAMRAA W81XWH-18-S-SOC1
Website: http://cdmrp.army.mil/; http://www.dcbids.net/bid-opportunities/2018/07/28/8804867-DoD-Vision-Investigator-Initiated-Research-Award.html

Brief Description: This BAA is intended to solicit extramural research and development ideas using the authority provided by United States Code, Title 10, Section 2358. This BAA is issued under the provisions of the Competition in Contracting Act of 1984 (Public Law 98-369), as implemented in Federal Acquisition Regulation 6.102(d) (2) and 35.016 and in DoD Grant and Agreement Regulations (DoDGARs) 22.315. In accordance with FAR 6.102, projects funded under this BAA must be for basic and applied research to support scientific study and experimentation directed toward advancing the state-of-the-art or increasing knowledge or understanding rather than focusing on development of a specific system or hardware solution. Research and development funding through this BAA are intended and expected to benefit and inform both military and civilian medical practice and knowledge. This BAA provides a general description of USSOCOM's research and development programs, including research areas of interest, evaluation and selection criteria, pre-proposal/preapplication and full proposal/application preparation instructions, and general administrative information. Submission of a pre-proposal/pre-application is required. After review, if the USSOCOM is interested in receiving a full proposal/application, the Applicant or Offeror will be invited to submit a full proposal or full application. Specific submission information and additional administrative requirements can be found in the document titled "General Submission Instructions" available in Grants.gov along with this BAA.
Pre-proposal: Required. All pre-applications for both extramural and intramural organizations must be submitted through eBRAP (https://eBRAP.org/).
Awards: Total Funding Available: $4,500,000
Proposal Deadline: 31 July, 2023, 11:59 p.m. Eastern Time
Contact Information: Questions related to BAA content or submission requirements as well as questions related to the submission of the pre-proposal/pre-application through eBRAP should be directed to the EBRAP Help Desk, which is available Monday through Friday from 8:00 a.m. to 5:00 p.m. Eastern Time. Response times may vary depending upon the volume of inquiries. Phone: 301-682-5507 Email: help@eBRAP.org

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Grant Program: NRL Long Range Broad Agency Announcement (BAA) for Basic and Applied Research
Agency: Department of Defense Naval Research Laboratory N00173-18-S-BA01
Website: https://www.nrl.navy.mil/doing-business/Current-NRL-BAA
Brief Description: The Naval Research Laboratory (NRL) The Naval Research Laboratory (NRL) is the Navy's corporate laboratory. NRL conducts basic and applied research for the Navy in a variety of scientific and technical disciplines. The basic research program is driven by perceptions about future requirements of the Navy. NRL conducts most of its research program at its own facilities but also funds some related research such as anticipated by this announcement. More extensive research support opportunities are available from the Naval Research Laboratory (NRL). NRL announcements may be accessed via the Internet at https://www.nrl.navy.mil/doingbusiness/contracting-division/baa. NRL is interested in receiving proposals for Long-Range Science and Technology (S&T) Projects which offer potential for advancement and improvement of Navy and Marine Corps operations. Readers should note that this is an announcement to declare NRL's broad role in competitive funding of meritorious research across a spectrum of science and engineering disciplines. A brief description of the NRL Program Codes and the science and technology thrusts that NRL is pursuing is provided below. Additional information can be found at the NRL website at https://www.nrl.navy.mil/research/directorates-divisions/. This announcement is an expression of interest only and does not commit the Government to make any award or to pay for any proposal preparation costs. The cost of proposal preparation for response to a BAA is not considered an allowable direct charge to any resultant contract or any other contract; however, it may be an allowable expense to the normal bid and proposal indirect cost specified in FAR 31.205-18.
Awards: Various

Proposal Deadline: May 9, 2019
Contact Information: Mary Johnson Contract Specialist Phone 202-767-2021

Department of Education

Grant Program: Institute of Education Sciences (IES): Education Research CFDA Number 84.305A
Agency: Department of Education ED-GRANTS-052118-001
Website: https://www.gpo.gov/fdsys/pkg/FR-2018-05-21/pdf/2018-10802.pdf
Brief Description: Each funding opportunity description is a synopsis of information in the Federal Register application notice. For specific information about eligibility, please see the official application notice. The official version of this document is the document published in the Federal Register. Free Internet access to the official edition of the Federal Register and the Code of Federal Regulations is available on GPO Access at: http://www.access.gpo.gov/nara/index.html. Please review the official application notice for pre-application and application requirements, application submission information, performance measures, priorities and program contact information.
For the addresses for obtaining and submitting an application, please refer to our Common Instructions for Applicants to Department of Education Discretionary Grant Programs, published in the Federal Register on February 12, 2018 (83 FR 6003) and available atwww.gpo.gov/fdsys/pkg/FR-2018-02-12/pdf/2018-02558.pdf.

The dates when applications are available and the deadlines for transmittal of applications invited under this notice are indicated in the chart at the end of this notice and in the Requests for Applications (RFAs) that are posted at the following websites: https://ies.ed.gov/funding,https://www.ed.gov/programs/edresearch/index.html,and https://www.ed.gov/programs/specialedresearch/index.html.

Purpose of Program: In awarding these grants, the Institute of Education Sciences (Institute) intends to provide national leadership in expanding fundamental knowledge and understanding of (1) developmental and school readiness outcomes for infants and toddlers with or at risk for a disability, (2) education outcomes for all students from early childhood education through postsecondary and adult education, and (3) employment and wage outcomes when relevant (such as for students who engaged in career and technical, postsecondary, or adult education). The Institute's research grant programs are designed to provide interested individuals and the general public with reliable and valid information about education practices that support learning and improve academic achievement and access to education opportunities for all students. These interested individuals include parents, educators, students, researchers, and policymakers. In carrying out its grant programs, the Institute provides support for programs of research in areas of demonstrated national need.

Competitions in This Notice: The Institute will conduct nine research competitions in FY 2019 through two of its centers: The Institute's National Center for Education Research (NCER) will hold a total of five competitions--one competition in each of the following areas: Education research; education research and development centers; statistical and research methodology in education; partnerships and collaborations focused on problems of practice or policy; and low-cost, short-duration evaluation of education interventions.

Catalog of Federal Domestic Assistance (CFDA) numbers 84.305A, 84.305C, 84.305D, 84.305H, 84.305L, 84.324A, 84.324B, 84.324L, and 84.324N.
Awards: Up to $4,000,000. Estimated total funding: $115,000,000
Proposal Deadline: Aug 23, 2018 Application Package Available: June 21, 2018. Deadline for Transmittal of Applications: August 23, 2018

Contact Information: Julius Cotton ED Grants.gov FIND Systems Admin. Phone 202-245-6288 EducationGrantInquiries@ed.gov
Program Manager: Molly Faulkner-Bond e-Mail: Molly.Faulkner-Bond@ed.gov .

EPA

Grant Program: Practical Methods to Analyze and Treat Emerging Contaminants (PFAS) in Solid Waste, Landfills, Wastewater/Leachates, Soils, and Groundwater to Protect Human Health and the Environment
Agency: Environmental Protection Agency EPA-G2018-STAR-B1
EPA-G2018-STAR-B1, Practical Methods to Analyze and Treat Emerging Contaminants (PFAS) in Solid Waste, Landfills, Wastewater/Leachates, Soils, and Groundwater to Protect Human Health and the Environment
EPA-G2018-STAR-B2, Early Career: Practical Methods to Analyze and Treat Emerging Contaminants (PFAS) in Solid Waste, Landfills, Wastewater/Leachates, Soils, and Groundwater to Protect Human Health and the Environment
Website: https://www.epa.gov/research-grants/practical-methods-analyze-and-treat-emerging-contaminants-pfas-solid-waste-landfills#Award
Brief Description: The U.S. Environmental Protection Agency (EPA), as part of its Science to Achieve Results (STAR) program, is seeking applications proposing research that will lead to: (1) better understanding and characterization of the types and quantities of current and historical per- and poly-fluoroalkyl substances (PFAS) and PFAS-containing waste associated with waste disposal (e.g., landfills), as well as media containing PFAS released from these activities (e.g., PFAS in leachate collected by landfills or PFAS leaching to subsurface soils and groundwater); (2) increased knowledge of the fate, transport, potential for degradation or other changes to PFAS, and their mobility during materials management (e.g., under different landfill conditions such as pH, temperature, moisture content) that facilitate or retard such transformation or movement; and (3) new or improved methods that are more effective, efficient (in cost, energy, etc.), and practical in controlling, treating, destroying, or removing PFAS in waste and wastewater, landfill leachates, biosolids, or environmental media. The main goal is to promote innovation in evaluating and managing PFAS in solid waste, landfills, and environmental media that will lead to improved decision making, management practices, and technical methods to minimize the risks to both humans and ecosystems.

This solicitation provides the opportunity for the submission of applications for projects that may involve human subjects research. Human subjects research supported by the EPA is governed by EPA Regulation 40 CFR Part 26 (Protection of Human Subjects). This includes the Common Rule at subpart A and prohibitions and additional protections for pregnant women and fetuses, nursing women, and children at subparts B, C, and D. Research meeting the regulatory definition of intentional exposure research found in subpart B is prohibited by that subpart in pregnant women, nursing women, and children. Research meeting the regulatory definition of observational research found in subparts C and D is subject to the additional protections found in those subparts for pregnant women and fetuses (subpart C) and children (subpart D). All applications must include a Human Subjects Research Statement (HSRS, as described in Section IV.C.5.c of this solicitation), and if the project involves human subjects research, it will be subject to an additional level of review prior to funding decisions being made as described in Sections V.D and V.E of this solicitation.
Awards; Up to a total of $900,000 for a regular award and up to a total of $500,000 for an early career award; Available Funding: $6,000,000
Submission Deadline: Full Application Submission Deadline: October 2, 2018

Contact Information: Technical Contact: Intaek Hahn (hahn.intaek@epa.gov); phone: 202-564-4377 Eligibility Contact: Ron Josephson (josephson.ron@epa.gov); phone: 202-564-7823

Department of Energy

Grant Program: Big Data Analysis of Synchrophasor Data
Agency: Department of Energy DE-FOA-0001861
Website:
https://www.fedconnect.net/FedConnect/default.aspx?ReturnUrl=%2ffedconnect%3fdoc%3dDE-FOA-0001861%26agency%3dDOE&doc=DE-FOA-0001861&agency=DOE
Brief Description: The goal of this FOA is to explore the use of big data, artificial intelligence (AI), and machine learning technology and tools on PMU data to identify and improve existing knowledge, and to discover new insights and tools for better grid operation and management. Applicants selected for award will receive pre-packaged datasets assembled exclusively for their use executing awards resulting from this FOA. Applicants selected for award will be asked to address specific questions and research areas regarding the data. Applicants selected for award will publicly present their analytical results at a DOE-sponsored event to inform stakeholders in the electricity sector who develop and use analytical and decision-making tools on PMU and other power system data.
Awards: Up to $1,000,000; Available funding: $8,000,000
Submission Deadline: November 9, 2018
Contact Information: Maureen.Davison@NETL.DOE.GOV

Grant Program: Machine Learning for Geothermal Energy
Agency: Department of Energy DE-FOA-0001956
Website: https://eere-exchange.energy.gov/
Brief Description: The U.S. Department of Energy's Geothermal Technology Office (GTO) Machine Learning for Geothermal Energy funding opportunity announcement (FOA) supports projects that will develop new analytical tools for finding and developing geothermal resources and establish the practice of machine learning in geothermal operations. The rapidly advancing field of Machine Learning (ML) offers substantial opportunities for technology advancement and cost reduction throughout the geothermal project lifecycle, from resource exploration to power plant operations. Under this funding opportunity, GTO is interested in two topic areas:
Topic 1: Machine Learning for Geothermal Exploration - GTO seeks projects that advance geothermal exploration through the application of machine learning techniques to geological, geophysical, geochemical, borehole, and other relevant datasets. Of particular interest to GTO are projects that will identify data acquisition targets and build community datasets for future work.
Topic 2: Advanced Analytics for Efficiency and Automation in Geothermal Operations - GTO seeks projects that apply advanced analytics to power plant and other operator datasets, with the goal of improving operations and resource management.
For questions and answers pertaining to this FOA, please reference the DE-FOA-0001956 Machine Learning FAQ Log in FOA Documents.
Awards; Up to $700,000; Available Funding: $3,600,000
Submission Deadline: Concept Paper Submission Deadline: 8/23/2018 5:00 PM ET

- Full Application Submission Deadline: 11/1/2018 5:00 PM ET

Contact Information: EERE-ExchangeSupport@hq.doe.gov For Exchange related support and issues.

- machinelearninggeo@ee.doe.gov For questions regarding the FOA

NASA

Grant Program: Solar System Exploration Research Virtual Institute Cooperative Agreement Notice (SSERVI CAN-3)
Agency: NASA NNH18ZDA018C
Website: https://nspires.nasaprs.com/external/solicitations/summary!init.do?solId=%7BDBFE67A3-498A-66A0-3102-3F100B5D0779%7D&path=open
Brief Description: NASA, through the release of this Cooperative Agreement Notice (CAN), is announcing an opportunity for the submission of multi-institutional team-based proposals for research as participating members of the Solar System Exploration Research Virtual Institute (SSERVI), hereafter referred to as "the Institute." Proposals must clearly articulate an innovative research program addressing basic and/or applied research fundamental to understanding the nature of the Moon, Near Earth Asteroids (NEAs), the martian moons Phobos and Deimos, and the near space environments of these bodies, to enable eventual human exploration of these destinations. Although the Institute will continue to support research addressing all of these potential human exploration destinations, in light of the administration's focus on returning to the Moon, as well as the near-term opportunities that will be provided by the burgeoning commercial lunar industry, proposals which address these near-term lunar needs and opportunities will be given preference. Proposed research that complements current CAN-2 Institute Teams, and/or addresses important research areas not currently covered in the Institute, will be given strong consideration (see: http://sservi.nasa.gov/sserviteams/).
Awards: Various
Proposal Deadline: Step-1 Proposal due on October 19, 2018
Step-2 Full proposals are Due: 11:59 PM Eastern Time on December 18, 2018.
Contact: Dr. Sarah Noble Science Mission Directorate NASA Headquarters HQ-SSERVI@mail.nasa.gov

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Grant Program: Use of the NASA Physical Sciences Informatics System - Appendix E
Agency: NASA NNH17ZTT001N-17PSI-E
Website: https://nspires.nasaprs.com/external/solicitations/summary!init.do?solId={2AF0A877-0C3F-8E34-5954-223EAAD4CBB4}&path=open
Brief Description: This National Aeronautics and Space Administration (NASA) Research Announcement (NRA) solicits ground-based research proposals using an open science approach to develop new analyses and generate new scientific insights by utilizing experimental data residing in NASA's Physical Sciences Informatics (PSI) system (https://psi.nasa.gov), an online database of completed physical science reduced-gravity flight experiments conducted on the International Space Station (ISS), on Space Shuttle flights, or on Free Flyers, and related ground-based studies. The goals of this NRA are to: a) promote investigations making use of currently available experimental data resulting in more scientists participating in reduced-gravity research; b) allow new areas of research and discovery to occur more quickly through open access; and c) accelerate the "research to product or publication" timeline through the rapid sharing of data. The PSI system allows researchers to data mine information generated by experiments conducted as part of NASA's Physical Sciences Research Program in support of NASA's Space Life and Physical Sciences Research and Applications (SLPSRA) Division. In this manner PSI meets the requirements of the nation's Open Data Policy, which states that "Government information shall be managed as an asset throughout its life cycle to promote interoperability and

openness, and, wherever possible and legally permissible, to ensure that data are released to the public in ways that make the data easy to find, accessible, and usable." (Executive Order May 9, 2013, "Making Open and Machine Readable the New Default for Government Information"). In accordance with this policy, all awardees from this NRA must upload data, new analytical or numerical models, tools, and software produced from the funded research into the PSI system. This solicitation is open to researchers from all categories of U.S. and non-U.S. organizations, including educational institutions, industry, nonprofit organizations, NASA Centers, and other U.S. Government agencies. This NRA is soliciting proposals from two types of investigators: 1) established researchers from all categories of U.S. and non-U.S. organizations; 2) graduate students (with advisors) from accredited U.S. postsecondary institutions and programs. The proposals from graduate students must be submitted by their advisor.
Awards: Various
Notice of Intent: Not Required
Proposal Deadline: December 14, 2018
Contact: Dr. Francis Chiaramonte, Program Scientist for Physical Sciences
NASA Headquarters
E-mail: francis.p.chiaramonte@nasa.gov
Phone: 202-358-0693

National Endowment of Humanities

Grant Program: Humanities Connections Implementation Grants
Agency: National Endowment of Humanities
Website: https://www.neh.gov/grants/education/humanities-connections-implementation-grants
Brief Description: The Humanities Connections program seeks to expand the role of the humanities in undergraduate education at two- and four-year institutions. Awards will support innovative curricular approaches that foster productive partnerships among humanities faculty and their counterparts in the social and natural sciences and in pre-service or professional programs (such as business, engineering, health sciences, law, computer science, and other technology-driven fields), in order to encourage and develop new integrative learning opportunities for students.
Competitive applications will demonstrate

- that the proposed curricular projects address significant and compelling topics or issues in undergraduate education at the applicant institution(s);
- that these projects develop the intellectual skills and habits of mind cultivated by the humanities; and
- that faculty and students will benefit from meaningful collaborations in teaching and learning across disciplines as a result of the project.

Humanities Connections projects have four core features:

1. integration of the subject matter, perspectives, and pedagogical approaches of two or more disciplines (with a minimum of one in and one outside of the humanities);
2. collaboration between faculty from two or more separate departments or schools at one or more institutions;
3. experiential learning as an intrinsic part of the curricular plan; and
4. long-term institutional support for the proposed curriculum innovation(s).

Award: Up to $100,000
Proposal Deadline: October 17, 2018
Contact: Contact the staff of NEH's Division of Education Programs at 202-606-8337 or humanitiesconnections@neh.gov.

American Chemical Society

Grant Program: Doctoral New Investigator (DNI) Grants
Agency: American Chemical Society Petroleum Research Fund
Website: https://www.acs.org/content/acs/en/funding-and-awards/grants/prf/programs/dni.html
Brief Description: The goals of the American Chemical Society Petroleum Research Fund are:

- To support fundamental research in the petroleum field, and
- To develop the next generation of engineers and scientists through support of advanced scientific education.

The Doctoral New Investigator grants program aims to promote the careers of young faculty by supporting research of high scientific caliber, and to enhance the career opportunities of their undergraduate/ graduate students, and postdoctoral associates through the research experience.

Doctoral New Investigator (DNI) grants provide start-up funding for scientists and engineers in the United States who are within the first three years of their first academic appointment at the level of Assistant Professor or the equivalent. Applicants may have limited or no preliminary results for a research project they wish to pursue, with the intention of using the preliminary results obtained to seek continuation funding from other agencies. The DNI grants are to be used to illustrate proof of principle or concept, to test a hypothesis, or to demonstrate feasibility of an approach.

The DNI grants program is seeking investigator-initiated, original research across the spectrum of our mission. Original research is defined as being different from that performed previously by the PI as part of their graduate or postdoctoral studies. Excluded from consideration are proposals in which the ideas being presented are a mere extension of research from the PI's graduate or postdoctoral experience. Research projects must be unique. Although a PI may send the same proposal to more than one agency, PRF will not support a project having overlap, or partial overlap, with research funded by another agency.
Award: $110,000 over 2 years
Pre-Proposal Deadline: October 29, 2018
University Nomination Process and Contact: If interested, please send an email to Eric Blitz (eric.blitz@njit.edu) and Atam Dhawan (dhawan@njit.edu).

RWJ Foundation

Grant Program: Pioneering Ideas and a Culture of Health
Agency: RWJ Foundation
Website: https://www.rwjf.org/en/how-we-work/submit-a-proposal.html?rid=0034400001rmIamAAE&et_cid=1371822
Brief Description: The goal of the *Pioneering Ideas Brief Proposal* funding opportunity is to explore; to look into the future and put health first as we design for changes in how we live, learn, work and play; to wade into uncharted territory in order to better understand what new trends, opportunities and breakthrough ideas can enable everyone in America to live the healthiest life possible.
While improving the status quo is vital to the health and well-being of millions of Americans now, the *Pioneering Ideas Brief Proposal* opportunity reaches beyond incremental changes to explore the ideas and trends that will influence the trajectory and future of health. Ultimately, we support work that will help us learn what a Culture of Health can look like—and how we can get there.
Awards:
Featured Call for Ideas: Technology, Infrastructure and Health (submit brief proposals by 10/17/2018)
Dollar amount/duration: For this funding opportunity, we will award up to $2.4 million to fund projects within the $200,000-$400,000 budget range and with a project term of between 12-36 months.

Deadline: Please submit your ideas for **Technology, Infrastructure and Health** by October 17, 2018.
Open Call for Ideas (submit brief proposals by 10/15/18)
Dollar amount/duration: For this funding opportunity, we generally fund projects within the $150,000-$350,000 budget range and with a project term of between 12-36 months.
Deadline: Please submit your pioneering ideas by October 15, 2018.
Contact: Please let Eric Blitz (eric.blitz@njit.edu) and Atam Dhawan (dhawan@njit.edu) know if you are interested in applying.

Gates Foundation

Grant Program: Grand Challenges Explorations
Agency: Gates Foundation
Website: https://gcgh.grandchallenges.org/grant-opportunities
Brief Description: The Bill & Melinda Gates Foundation is inviting proposals for the latest round of the Grand Challenges Explorations Grants of $100,000 for18-months for Phase I Project on:

- Increasing Demand for Vaccination Services
- New Approaches for Manufacturing Gut Microbial Biotherapeutics
- Innovation for WASH in Urban Settings
- New Approaches for Strategic Prioritization of Agricultural Development Policies
- Tools and Technologies for Broad-Scale Pest and Disease Surveillance of Crop Plants in Low-Income Countries
- Innovations Driving Programmatic Performance in Immunization: Service Experience and Data Use + Measurement

Awards: $100,000
Contact: Please let Eric Blitz (eric.blitz@njit.edu) and Atam Dhawan (dhawan@njit.edu) know if you are interested in applying.

Streamlyne Question of the Week

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

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

Streamlyne Information

Streamlyne User Manuals: http://www.njit.edu/research/streamlyne/

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

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

How-to-do-Videos

New "How to Do" videos have been posted on the research website http://www5.njit.edu/research/streamlyne/. The videos show step-by-step process on the following tasks:

- How to Begin Proposal Submission in Streamlyne
- How to Input Proposal Budget
- How to Process Approvals
- How to Upload Proposal Attachments
- How to Search for a Proposal that is in Route
- Difference Between "Prime Sponsor Code" and "Sponsor Code"
- How to Select an RR Budget, RR Sub-award or Modular Budget
- How to Add a Student/Summary
- Participant Support Categories
- Supplies Specific Category Materials
- How to Create a Modular Budget

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

John McCarthy, NCE Director of Research; (973) 596-3247; john.p.mccarthy@njit.edu
Cristo Leon, CSLA Director of Research; (973) 596-6426; cristo.e.yanezleon@njit.edu
Sean Andrews, YWCC Director of Research; (973) 596-5352; sean.t.andrews@njit.edu
Iris Pantoja, NCE, CoAD and MTSM Project Manager; 973-596-4483; irp3@njit.edu

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Need Information about Funding?

Finding Research Opportunities and Collaborations (FROC)
***Walk-In* Open-Hour Discussion with SVPR Over Tea**

Every Thursday: 3.00 PM-4.00 PM; 340 Fenster Hall

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

- Research opportunities and potential collaborations
- Currently active RFPs and developing collaborative teams for proposal submission
- Proposal review criterion for specific RFP/program/agency
- Proposal concept and draft review in the context of review criterion
- Future plans for proposal development and submission

- Invention disclosures, patent applications and processing of intellectual property
- External faculty research awards including fellowships

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

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

Enjoy coffee/tea and cookies with SVPR over the discussion.

For any questions and additional information, please send an email to SVPR at dhawan@njit.edu.
