NJIT Research Newsletter

Issue: ORN-2016-03

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

Recent Research Grant and Contract Awards

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

PI: Shawn Chester (PI)
Department: Mechanical and Industrial Engineering
Grant/Contract Project Title: Mechanics of photo-responsive shape-memory polymers
Funding Agency: Haythornthwaite Foundation, ASME
Duration: 11/15/15-11/14/16

PI: James Haorah (PI)
Department: Biomedical Engineering
Grant/Contract Project Title: Mechanisms of Atherosclerosis in Alcohol Intake
Funding Agency: NIH
Duration: 09/05/14-08/31/16

PI: Wenbo Cai (PI)
Department: Mechanical and Industrial Engineering
Grant/Contract Project Title: REU supplement: Collaborative Research: Optimizing Incentives for Carbon Capture and Storage Systems
Funding Agency: NSF
Duration: 11/15/15-11/14/16

PI: Wen Zhang (PI)
Department: Civil and Environmental Engineering
Grant/Contract Project Title: Arsenic Leach Test for Exclave Soil Samples
Funding Agency: Hatch Mott McDonald
Duration: 11/15/15-11/14/16

NJII

PI: Donald Sebastian (PI)
Department: NJII
Grant/Contract Project Title: Development and Setting Up of Production line of Hollow Fibers for Refine Technology
Funding Agency: Refine Technology, LLC
Duration: 01/13/16-01/12/17

Events and Announcements

Event: NJIT President's Forum and 2016 Faculty Research Showcase
When: February 22, 2016: 10.00 AM – 3.00 PM
Where: President's Forum and Keynote Address: Atrium, Campus Center
Faculty Research Presentations and Poster Session: Ballroom A
President's Forum Speaker: Michael, Doyle, Founding Chairman and CTO, Eolas Technologies; Founder and Chairman, National Museum of Health and Medicine; Founder and Chairman, CodeAbode
Title of the Talk: Treading Water in the Digital Ocean: Diving-In Over the Head Can Sometimes Lead to Surfing the Big Waves
Biographical Sketch of the Speaker: Dr. Michael Doyle is the Chairman and CTO of Eolas Technologies Inc., and is the founder and Chairman of the National Museum of Health and Medicine Chicago. He is an active angel investor and co-founder in several Chicago-area tech startups, and is the founder of CodeAbode, the nation's first code bootcamp focused in the areas of health, medicine and fitness.

Prior to founding Eolas in 1994, Dr. Doyle served as Director for the Center for Knowledge Management at the University of California, San Francisco. While at UCSF Medical Center, in 1993, Dr. Doyle led the research team that invented the fundamental web technologies which enabled Web browsers for the first time to act as platforms for fully-interactive remotely-distributed applications, in the process pioneering the revolutionary Web technologies today known as streaming media and cloud computing. Dr. Doyle successfully guided Eolas through the development of several key technologies in use throughout the Internet. Dr. Doyle's seminal research in next-generation Web applications, hypermedia navigation, mobile telecommunications, 3-D biomedical visualization, and morpho-spatial genomic activity mapping has led to advances that have gained worldwide recognition. His invention of the field of transient-key cryptography led to the technology which comprises the x9.95 ANSI National Standard for secure timestamps, and forms the basis for the revolutionary new eCheck system from Deluxe Check Company.

From 2000-2004, Dr. Doyle served as Chief Scientist on the Visible Embryo Project Next Generation Internet Project, a contract from the National Institutes of Health funding development of new kinds of applications that would work with powerful computers over high-speed networks. As part of this project, the University team reconstructed over 30 embryos from the Carnegie Collection and made them available on computers at the San Diego Supercomputer Center at the University of California San Diego, enabling scientists at Johns Hopkins University to compare the reconstructed Carnegie Collection data to 3D ultrasounds to detect birth defects and plan intrauterine surgeries to correct them.

In 2012, Dr. Doyle led the development of the Eolas vScope interactive cloud-based streaming virtual microscope system, and its adaptation to create the first neuroanatomical atlas of Albert Einstein's brain, released in September of that year as the Einstein Brain Atlas app in Apple's iPad app store, an event which received worldwide press coverage, including coverage on the Today Show and Good Morning America.

Dr. Doyle currently serves on the Board of Trustees of Beloit College, and the Advisory Council of the UIC College of Applied Health Sciences. He was the 2013 recipient of the UIC AHS Distinguished Alumni Achievement Award, and is a member of ACM, IEEE, Sigma Xi, Phi Kappa Phi, Mensa, the Triple Nine Society, and the Ultranet. He is an active philanthropist, supporting a variety of charitable causes in the sciences and the arts both personally and through his family foundation, the Buonacorsi Foundation.

Event Description: The 2016 NJIT Faculty Research Showcase will start with the President's Forum with the Keynote Address by Dr. Michael Doyle. The showcase will introduce new NJIT faculty who have joined us in academic year 2015-16 with brief presentations on their research work. New faculty presentations will be followed by the electronic posters and networking session featuring research projects with recipients of the 2015 NJIT Faculty Seed Grants. Faculty, staff and students are welcome to join us at this interdisciplinary networking event to learn about exciting ongoing research projects, and explore future collaborative opportunities.

Event: NJIT CSLA Distinguished Lecture
Title: How To Control A Zombie Army: The New Science of Neuroparasitology
Speaker: Carl Zimmer
When and Where: Thursday, January 28, 2016; 4.00 PM, Campus Center Atrium
Abstract: Parasites used to be considered nothing more than freeloaders, taking advantage of their hosts. Now scientists are discovering a sinister sophistication to these creatures. Many species can control their hosts and force them to do their bidding. Researchers are only beginning to explore this remarkable mind-control, developing a field that's been called neuroparasitology that could someday help us find better ways to treat disorders in our own brains.
Speaker Biographical Sketch: Carl Zimmer is a prolific science writer and columnist for "Matter" (a weekly series in the NY Times), award-winning blog "The Loom" hosted by National Geographic, author of numerous books (including two widely-acclaimed textbooks on evolution), host of the "Science Happens" video series for STAT (a health and medicine publication), a three-time recipient of the Science Journalism award from the AAAS, and recipient of the Distinguished Service Award from the National Association of Biology Teachers.

Event: NSF Webinar: Computational Thinking, Inferential Thinking and Data Science
Host: NSF Data Science Webinar
When: January 28, 2016 11:00 AM-12.00 PM
Website: http://www.nsf.gov/events/event_summ.jsp?cntn_id=137449&org=NSF
Speaker: Michael I. Jordan, Distinguished Professor, Department of Electrical Engineering and Computer Science and the Department of Statistics, University of California, Berkeley
Abstract: The phenomenon of Big Data is creating a need for research perspectives that blend computational thinking (with its focus on, e.g., abstractions, algorithms and scalability) with inferential thinking (with its focus on, e.g., underlying populations, sampling patterns, error bars and predictions). There are many grand challenges involving in creating such a blend; indeed,

there are foundational problems that span computation and inference that are far from being solved. There are also many implications for research, technology, policy and education.
Speaker Bio: Michael I. Jordan is the Pehong Chen Distinguished Professor in the Department of Electrical Engineering and Computer Science and the Department of Statistics at the University of California, Berkeley. He received his Masters in Mathematics from Arizona State University, and earned his PhD in Cognitive Science in 1985 from the University of California, San Diego. He was a professor at MIT from 1988 to 1998. His research interests bridge the computational, statistical, cognitive and biological sciences, and have focused in recent years on Bayesian nonparametric analysis, probabilistic graphical models, spectral methods, kernel machines and applications to problems in distributed computing systems, natural language processing, signal processing and statistical genetics. Prof. Jordan is a member of the National Academy of Sciences, a member of the National Academy of Engineering and a member of the American Academy of Arts and Sciences. He is a Fellow of the American Association for the Advancement of Science. He has been named a Neyman Lecturer and a Medallion Lecturer by the Institute of Mathematical Statistics. He received the David E. Rumelhart Prize in 2015 and the ACM/AAAI Allen Newell Award in 2009. He is a Fellow of the AAAI, ACM, ASA, CSS, IEEE, IMS, ISBA and SIAM
To Join the Webinar: Please register at:
https://nsf.webex.com/nsf/j.php?RGID=r1f835c8027254103fada5df81e24c9c2 by 11:59pm EST on Wednesday, January 27, 2016.

Event: NSF Distinguished Lecture Series in Mathematical and Physical Sciences: *Challenges at the Intersection of Nuclear Physics and Astrophysics*
Host: NSF
When: January 25, 2016 2:00 PM
Website: http://www.nsf.gov/events/event_summ.jsp?cntn_id=136075&org=NSF
Contact for More Information: Andrew J. Lovinger, (703) 292-4933, alovinge@nsf.gov

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Grant Opportunity Alerts

Keywords and Areas Included in Grant Opportunity Alerts**:**

NSF: Presidential Awards for Excellence in Science, Mathematics and Engineering Mentoring; Ideas Lab: Cybersecurity Innovation for Cyberinfrastructure (CICI); Software Infrastructure for Sustained Innovation (SI2: SSE & SSI); Data Infrastructure Building Blocks (DIBBs)
NIH: Noise-Induced Synaptopathy in the Human Auditory System (R01); ENCODE Data Coordinating Center (U24); Education and Health: New Frontiers (R01)
Department of Defense/US Army/DARPA/ONR: Neural Engineering System Design (NESD); Fundamental Limits of Photon Detection (Detect); Minerva Research Initiative; Industry Partnerships for Cybersecurity of Energy Delivery Systems (CEDS) Research; Synchrophasor Applications and Tools for Reliability, Market Efficiency, and Asset Management; Fiscal Year 2016 Vehicle Technologies Program Wide Funding Opportunity Announcement

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Grant Opportunities

National Science Foundation

Grant Program: Presidential Awards for Excellence in Science, Mathematics and Engineering Mentoring
Agency: National Science Foundation NSF 16-534
RFP Website: http://www.nsf.gov/pubs/2016/nsf16534/nsf16534.htm
Brief Description: The Presidential Awards for Excellence in Science, Mathematics and Engineering Mentoring (PAESMEM) is a Presidential award established by the White House in 1995. The PAESMEM program is administered by the National Science Foundation (NSF) on behalf of the White House Office of Science and Technology Policy (OSTP).

Nominations, including self-nominations, are invited for "Individual" and "Organizational" PAESMEM awards. Individuals and organizations in all public and private sectors are eligible including industry, academia, K-12, military and government, non-profit organizations, and foundations. Exceptional STEM or STEM-related mentoring in both formal and/or informal settings is eligible for the PAESMEM award.

Nominations are encouraged from all geographical regions in the U.S. including its territories and particularly jurisdictions designated by Congress under NSF's Experimental Program to Stimulate Competitive Research (EPSCoR). NSF EPSCoR-designated jurisdictions are: Alabama, Alaska, Arkansas, Delaware, Guam, Hawaii, Idaho, Kansas, Kentucky, Louisiana, Maine, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Oklahoma, Puerto Rico, Rhode Island, South Carolina, South Dakota, Vermont, Virgin Islands, West Virginia, and Wyoming. Nominations from the U.S. Territories are particularly encouraged. Each "Individual" or "Organizational" PAESMEM awardee will receive a $10,000 award and a commemorative Presidential certificate. Awardees are also invited to participate in an award recognition ceremony in Washington, DC that includes meetings with STEM educators, researchers and policy leaders. Up to 16 awards may be made from the nominations received on or before June 17, 2016.
Awards: Approximately 16 nominees total from both categories will be recommended to the White House for award recognition from the 2016-2017 competition. These awardees will represent the 2017 cohort of PAESMEM awardees. Anticipated Funding Amount: $160,000.
Letter of Intent: Not Required
Full Proposal Submission Window: January 25, 2016 - June 17, 2016
Contacts:

- Martha L. James, Program Officer, Division of Human Resource Development, 815, telephone: (703) 292-7772, fax: (703) 292-9019, email: mjames@nsf.gov
- Nafeesa Owens, Program Officer, Division of Human Resource Development, 815, telephone: (703) 292-5120, fax: (703) 292-9019, email: nowens@nsf.gov
- Nicole Gass, Program Specialist, Division of Human Resource Development, 815, telephone: 703-292-8378, fax: 703-292-9019, email: ngodwin@nsf.gov

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Grant Program: Ideas Lab: Cybersecurity Innovation for Cyberinfrastructure (CICI)
Agency: National Science Foundation NSF 16-533
RFP Website: http://www.nsf.gov/pubs/2016/nsf16533/nsf16533.htm
Brief Description: Advancements in data-driven scientific research depend on trustworthy and reliable cyberinfrastructure. Researchers rely on a variety of networked technologies and software tools to achieve their scientific goals. These may include local or remote instruments,

wireless sensors, software programs, operating systems, database servers, high-performance computing, large-scale storage, and other critical infrastructure connected by high-speed networking. This complex, distributed, interconnected global cyberinfrastructure ecosystem presents unique cybersecurity challenges. NSF-funded scientific instruments, sensors and equipment are specialized, highly-visible assets that present attractive targets for both unintentional errors and malicious activity; untrustworthy software or a loss of integrity of the data collected by a scientific instrument may mean corrupt, skewed or incomplete results. Furthermore, often data-driven research, e.g., in the medical field or in the social sciences, requires access to private information, and exposure of such data may cause financial, reputational and/or other damage.

Therefore, an increasing area of focus for NSF is the development and deployment of hardware and software technologies and techniques to protect research cyberinfrastructure across every stage of the scientific workflow.

Awards: Standard Grants. Anticipated available funding: $7,000,000
Letter of Intent: Required; Deadline: March 01, 2016
Full Proposal Deadlines: April 19, 2016
Contacts:

- Anita Nikolich, Program Director, CISE/ACI, telephone: (703) 292-4551, email: anikolic@nsf.gov

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Grant Program: Software Infrastructure for Sustained Innovation (SI2: SSE & SSI)
Agency: National Science Foundation NSF 16-532
RFP Website: http://www.nsf.gov/pubs/2016/nsf16532/nsf16532.htm
Brief Description: Software is an integral enabler of computation, experiment and theory and a primary modality for realizing the Cyberinfrastructure Framework for 21st Century Science and Engineering (CIF21) vision, as described in NSF 10-015. Scientific discovery and innovation are advancing along fundamentally new pathways opened by development of increasingly sophisticated software. Software is also directly responsible for increased scientific productivity and significant enhancement of researchers' capabilities. In order to nurture, accelerate and sustain this critical mode of scientific progress, NSF has established the Software Infrastructure for Sustained Innovation (SI^2) program, with the overarching goal of transforming innovations in research and education into sustained software resources that are an integral part of the cyberinfrastructure.

I^2 has been a long-term investment focused on catalyzing new thinking, paradigms, and practices in developing and using software to understand natural, human, and engineered systems. The intent of SI^2 has been to foster a pervasive cyberinfrastructure to help researchers address problems of unprecedented scale, complexity, resolution, and accuracy by integrating computation, data, networking, observations and experiments in novel ways. NSF expects that its SI^2 investment will result in trustworthy, robust, reliable, usable and sustainable software infrastructure that is critical to achieving the CIF21 vision and will transform science and engineering while contributing to the education of next-generation researchers and creators of future cyberinfrastructure. Indeed, education at all levels will play an important role in integrating such a dynamic cyberinfrastructure into the fabric of how science and engineering is performed.

The goal of the SI^2 program is to create a software ecosystem that includes all levels of the software stack and scales from individual or small groups of software innovators to large hubs of software excellence. The program addresses all aspects of cyberinfrastructure, from

embedded sensor systems and instruments, to desktops and high-end data and computing systems, to major instruments and facilities. Thus, SI^2 will continue to nurture the interdisciplinary processes required to support the entire software lifecycle, and will successfully integrate software development and support with innovation and research. Furthermore, it will result in the development of sustainable software communities that transcend scientific and geographical boundaries. SI^2envisions vibrant partnerships among academia, government laboratories and industry, including international entities, for the development and stewardship of a sustainable software infrastructure that can enhance productivity and accelerate innovation in science and engineering. Furthermore, SI^2 recognizes that integrated education activities will play a key role in sustaining the cyberinfrastructure over time and in developing a workforce capable of fully realizing its potential to transform science and engineering.

Awards: Standard Grants

Letter of Intent: Not Required

Full Proposal Deadlines: April 26, 2016 for SSE Proposals; September 19, 2016 for SSI Proposals

Contacts:

- Rajiv Ramnath, Program Director, CISE/ACI, telephone: (703) 292-4776, email: SI2Queries@nsf.gov
- Daniel S. Katz, Program Director, CISE/ACI, telephone: (703) 292-2254, email: SI2Queries@nsf.gov
- Peter H. McCartney, Program Director, BIO/DBI, telephone: (703) 292-8470, email: SI2Queries@nsf.gov

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Grant Program: Data Infrastructure Building Blocks (DIBBs)

Agency: National Science Foundation NSF 16-530

RFP Website: http://www.nsf.gov/pubs/2016/nsf16530/nsf16530.htm

Brief Description: The NSF vision for a Cyberinfrastructure Framework for 21st Century Science and Engineering (CIF21) considers an integrated, scalable, and sustainable cyberinfrastructure to be crucial for innovation in science and engineering (see www.nsf.gov/cif21). The Data Infrastructure Building Blocks (DIBBs) program is an integral part of CIF21. The DIBBs program encourages development of robust and shared data-centric cyberinfrastructure capabilities, to accelerate interdisciplinary and collaborative research in areas of inquiry stimulated by data.

DIBBs investments enable new data-focused services, capabilities, and resources to advance scientific discoveries, collaborations, and innovations. The investments are expected to build upon, integrate with, and contribute to existing community cyberinfrastructure, serving as evaluative resources while developments in national-scale access, policy, interoperability and sustainability continue to evolve.

Effective solutions will bring together cyberinfrastructure expertise and domain researchers, to ensure that the resulting cyberinfrastructure address researchers' data needs. The activities should address the data challenges arising in a disciplinary or cross-disciplinary context. (Throughout this solicitation, 'community' refers to a group of researchers interested in solving one or more linked scientific questions, while 'domains' and 'disciplines' refer to areas of expertise or application.) The projects should stimulate data-driven scientific discoveries and innovations, and address broad community needs.

This solicitation includes two classes of science data pilot awards:

- **Early Implementations** are large "at scale" evaluations, building upon cyberinfrastructure capabilities of existing research communities or recognized community data collections, and extending those data-focused cyberinfrastructure capabilities to additional research communities and domains with broad community engagement.
- **Pilot Demonstrations** address advanced cyberinfrastructure challenges across emerging research communities, building upon recognized community data collections and disciplinary research interests, to address specific challenges in science and engineering research.

Prospective PIs should be aware that DIBBs is a multi-directorate activity, and are encouraged to submit proposals that have broad, interdisciplinary interest. PIs are encouraged to refer to NSF core program descriptions, Dear Colleague Letters, and recently posted initiatives on directorate and divisional home pages to gain insight as to the priorities for the relevant area(s) of science and engineering in which their proposal may be responsive. **It is strongly recommended that a prospective PI contact a Cognizant Program Officer in the organization(s) closest to the major disciplinary impact of the proposed work to ascertain whether the scientific focus and budget of the proposed work are appropriate for this solicitation.**

Awards: Standard Grants. The anticipated funding amount is $23,500,000 total for this solicitation.

- The award size for Early Implementation Awards is anticipated to be up to $4,000,000 total per award for up to 5 years.
- The award size for Pilot Demonstration Awards is anticipated to be up to $500,000 total per award for up to 3 years

Letter of Intent: Not Required

Full Proposal Deadlines: April 4, 2016

Contacts:

- Amy Walton, Program Director, CISE/ACI and DIBBs Solicitation Manager, telephone: (703) 292-8970, email: DIBBsQueries@nsf.gov
- Robert Chadduck, Program Director, CISE/ACI, telephone: (703) 292-8970, email: DIBBsQueries@nsf.gov

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National Institutes of Health

Grant Program: Noise-Induced Synaptopathy in the Human Auditory System (R01)
Agency: National Institutes of Health RFA-DC-17-002
RFP Website: http://grants.nih.gov/grants/guide/rfa-files/RFA-DC-17-002.html
Brief Description: This FOA solicits applications focused on determining if noise exposures that typically result in a temporary noise-induced elevation of auditory thresholds cause cochlear synaptopathy in humans. Examples of research questions that would be responsive to this FOA include, but are not limited to:

- Does cochlear synaptopathy occur in humans and if so, what is the extent of this type of damage? Do existing animal models faithfully represent the damage detected in humans?
- What is the most appropriate diagnostic test(s) for cochlear synaptopathy? What should be the "gold standard" measure of synaptopathy that can be used to determine the sensitivity and specificity of diagnostic tests?

- Are there perceptual consequences of noise-induced synaptopathy? If so, what are they and how can they best be measured?
- Does noise-induced synaptopathy underlie patient-reported difficulties in understanding speech in noise in the absence of hearing loss?
- Does noise-induced synaptopathy contribute to patient-reported difficulties in understanding speech in noise when hearing loss is also present?
- Is there a relationship between noise-induced synaptopathy and age-related hearing loss? If so, how can it best be characterized and understood?
- Is there a relationship between noise-induced synaptopathy and tinnitus? If so, how can it best be characterized and understood?

Approaches may include, but are not limited to:

- Behavioral tasks to detect cochlear synaptopathy including validation, sensitivity, specificity and test/retest reliability
- Electrophysiological measures for detecting cochlear synaptopathy including validation, sensitivity, specificity, time efficiency and test/retest reliability
- High-resolution, minimally invasive imaging of human auditory structures *in vivo*
- Computational modeling to make testable predictions for behavioral and physiological responses in animals and humans with synaptopathy, including responses to speech and non-speech stimuli.

Although of great importance to the NIDCD, applications focused on basic molecular/cellular aspects of cochlear synaptopathy without an immediate clinical impact or the mechanisms of noise-induced hair-cell death are not responsive to this FOA. Studies using animal models may be responsive to this FOA, but the direct applicability to cochlear synaptopathy in humans must be clearly delineated and justified. Investigators proposing animal studies are encouraged to contact NIDCD staff prior to submission of an application to determine responsiveness. The need for long-term longitudinal studies was identified by the Workshop panel, however, such studies are not responsive to this FOA due to the inherent extended nature of such projects; long-term longitudinal studies should instead be submitted using an investigator-initiated R01. Unresponsive applications will be withdrawn prior to peer review.

Applications may be milestone-driven, if appropriate, rather than hypothesis-driven. A milestone-driven format allows investigators to outline a series of project stages with specific criteria delineated for completion of each stage of the project. Milestone-driven applications should include contingency plans for each stage of the project.

Awards: The number of awards is contingent upon NIH appropriations and the submission of a sufficient number of meritorious applications. NIDCD intends to commit $1,500,000 in FY 2017 and $1,500,000 in FY 2018 to fund 3 awards per receipt date.

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

Deadline: May 24, 2016 and January 24, 2017, by 5:00 PM local time of applicant organization. All types of non-AIDS applications allowed for this funding opportunity announcement are due on these dates.

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

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

Grant Program: ENCODE Data Coordinating Center (U24)
Agency: National Institutes of Health RFA-HG-16-005
RFA-HG-16-002, UM1 Research Project with Complex Structure Cooperative Agreement

RFA-HG-16-003, UM1 Research Project with Complex Structure Cooperative Agreement
RFA-HG-16-004, U01 Research Project – Cooperative Agreements
RFA-HG-16-006, U24 Resource-Related Research Projects – Cooperative Agreements
RFP Website: http://grants.nih.gov/grants/guide/rfa-files/RFA-HG-16-005.html
Brief Description: The ENCODE Data Coordination and Analysis Center (EDCAC) will be an integrated, stable resource that will gather data and metadata from the ENCODE Project, integrate those data with genome sequences, serve as a resource from which the community can readily access ENCODE data, analyses, tools, and methods, and create and make available a high quality encyclopedia of candidate functional elements. It will be comprised of two components: a Data Coordination Center (DCC) funded through this FOA and a Data Analysis Center (DAC) funded through RFA-HG-16-006. The EDCAC should be prepared to work with data and metadata from the range of different experimental and computational projects that are expected to be funded through the companion FOAs (RFA-HG-16-002, RFA-HG-16-003, RFA-HG-16-004, RFA-HG-16-006), as well as functional genomics data derived by groups operating outside the ENCODE consortium. As the identity of the funded projects will not be known at the time that applications in response to this FOA are due, and given the disparate functional genomics data types created by the broader community, it will be necessary for applicants to provide a general plan that addresses the data currently being produced by the ENCODE projects, as well as other types of data related to functional sequence elements. A description of data and resources being produced in the current phase of the ENCODE project may be found at https://www.encodeproject.org.
This FOA solicits applications for a Data Coordination Center (DCC) component of the EDCAC. The DCC will:

- manage the uptake, quality control, and accessioning of data, metadata, tools, and analyses from all members of the ENCODE Consortium, as well as relevant functional genomics data generated outside of the consortium
- provide a portal to allow the community to visualize and download data, tools and analyses
- serve as a coordinating center for consortium activities
- lead consortium outreach efforts

The Data Analysis Center (DAC), described in the companion FOA RFA-HG-16-006, will initiate and lead integrative analyses. Once awards are made, the DCC and DAC awardees will be expected to work together as a highly coordinated team to provide a single, integrated EDCAC. Coordination will be essential to avoid duplication of effort and to ensure compatibility. For example, currently the DCC and DAC work together on uniform data processing, with the DAC leading the effort to specify the pipelines, and the DCC leading the effort to implement them. As the data storage, analysis, and dissemination needs of the Consortium change with time, either or both components of the EDCAC may be asked to modify their workflows as agreed upon by the ENCODE Consortium. Both components of the EDCAC should be flexible in their implementation of data management and analysis workflows.

The data management needs of the ENCODE Project will include tracking, storing, and providing access to primary data from multiple experimental methods, as well as to processed data from a variety of computational methods; both primary and processed data are used in the identification of genomic functional elements. Specifically, for each experimental platform used, there will be several levels of data produced that represent different steps in the analysis. Level 1 data are the primary data from a particular experimental platform, Level 2 data are the processed primary data, and Level 3 data are the interpreted data that define candidate functional elements. In some situations, integration of multiple datasets results in generation of Level 4 data, or summary data, that define a distinct set of candidate functional elements in the

genome. As an example, for a ChIP-seq experiment designed to define binding sites for a transcription factor, the sequence reads of the immunoprecipitated DNA are the Level 1 data, the reads aligned to the genome are the Level 2 data, the called peaks and signal tracks are the Level 3 data, while Level 4 data are predictions of promoters based on integration of transcription factor binding and chromatin modification profiles.

It is expected that applicants will be capable of working with data, metadata, and analyses from all members of the ENCODE Consortium.

Awards: Application budgets are not limited but need to reflect the actual needs of the proposed project. NHGRI intends to commit $5 million to $5.5 million in FY 2017 to fund one award.

Letter of Intent: February 21, 2016

Deadline: March 21, 2016, by 5:00 PM local time of applicant organization. All types of non-AIDS applications allowed for this funding opportunity announcement are due on this date.

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: Education and Health: New Frontiers (R01)
Agency: National Institutes of Health PAR-16-080
PAR-16-078, R21 Exploratory/Developmental Grant
PAR-16-079, R03 Small Grant Program
RFP Website: http://grants.nih.gov/grants/guide/pa-files/PAR-16-080.html

Brief Description: In June 2014, OBSSR convened a workshop that brought together clinicians and researchers in education and health in order to identify opportunities and gaps in the field as well as to develop strategies to ensure that education and health research remains a national priority. A summary of the meeting can be read here: https://obssr-archive.od.nih.gov/pdf/OBSSR_Education_and_Health_REV_8-22-2014_FINAL_RLA.pdf

Areas of research that were emphasized included: developing better measures of health outcomes (including cognitive function, subjective well-being, etc.), improving study designs, identifying mechanisms underlying the relationship between education and health, and considering contextual issues. Additionally, it was noted that there must also be attention to longitudinal research to understand long-term implications of early interventions and replication of studies to verify results. Themes evident throughout the meeting included the nature of the causal relationship between education and health, contextual issues, the need for more and better data, and interventions in education and health.

A number of private foundations have current initiatives which examine the links between health and education. The William T. Grant Foundation has recently examined the infrastructure to improve the use and usefulness of research in education http://blog.wtgrantfoundation.org/. The Robert Wood Johnson Foundation is exploring education and health within its series on the social determinants of health http://www.rwjf.org/en/how-we-work/grants/programs-and-initiatives.html. Their work examines the interrelated pathways through which educational attainment is linked to health outcomes, including through employment and income, and social and psychological factors. The W. K. Kellogg Foundation is addressing the health and well-being of children and families from interrelated fronts, including nutrition and education http://www.wkkf.org/grantseekers. The Open Society Foundation is committed to supporting quality education across the globe, imagining education as a key to civic participation and healthy lives http://www.opensocietyfoundations.org/. This PA seeks to supplement the work of these foundations by promoting an examination of the specific mechanisms through which

educational experiences and activities are linked to health outcomes, elucidate pathways and inform causal models that can inform more targeted interventions.

Recent contemporary work on educational attainment and adult health has demonstrated that the treatment of health is multi-dimensional and the treatment of education is not limited to a simple operationalization. Both health and education need to be examined in complex ways, using novel methodological tools and datasets, as well as situating analyses across diverse global spaces and within specific historical time periods to better understand the macro mechanisms which link educational attainment with health outcomes.

For this FOA, education refers to the comprehensive formal instruction that spans the human experience, from early childhood programs to pre-school, elementary and secondary schooling, college and adult learning programs. It includes the social and behavioral processes that are combined with formal instruction in educational environments. A better scientific understanding of the mechanisms linking education and health could lead to additional and improved prevention and therapeutic intervention strategies for important health problems. NOTE: This FOA is not directed at studies which limit their focus to the impact of specific health education courses or programs on health behaviors; rather, the focus is on the impact of more general education experiences.

In order to better understand these pathways, it will be necessary to explore what components or dimensions of education are important to health. The association or pathway between formal education and important health behaviors or diseases may not be causal. Instead it may reflect the influence of confounding or co-existing determinants or bi-directionality. Appropriate research topics for this FOA may involve pilot studies, new analyses of existing data, longitudinal studies, or a balance of approaches tailored for the study hypotheses. It is strongly encouraged that an application involve new teams of multidisciplinary researchers with expertise in both health and education domains.

Research Perspectives and Themes

To achieve the goal of a more comprehensive understanding of the mechanisms linking education and health outcomes, this FOA encourages the exploration of research perspectives and themes described below. The NIH believes these approaches may move current research efforts to the next level of accomplishment. Applicants are not required to incorporate all of the themes below into their research applications; however, applicants should explicitly address at least one.

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

Letter of Intent: Not Applicable.

Deadline: Standard NIH proposal submission dates.

Department of Defense/US Army/DARPA/ONR

Grant Program: Neural Engineering System Design (NESD)
Agency: Department of Defense DARPA - Biological Technologies Office
DARPA-BAA-16-09
RFP Website: https://www.fbo.gov/spg/ODA/DARPA/CMO/DARPA-BAA-16-09/listing.html
Brief Description: DARPA seeks proposals to design, build, demonstrate, and validate a neural interface system capable of recording from more than one million neurons and stimulating more than one hundred thousand neurons in proposer-defined regions of the human sensory cortex (e.g., visual cortex or auditory cortex). The complete system must demonstrate high-precision detection, transduction, and encoding of neural activity.

Awards: Cooperative Agreement.
Letter of Intent: Contact David Swan III, BAA Coordinator; DARPA-BAA-16-09@darpa.mil .
Deadline: April 14, 2016.

Grant Program: Fundamental Limits of Photon Detection (Detect)
Agency: Department of Defense DARPA - Defense Sciences Office DARPA-BAA-16-25
RFP Website: http://www.darpa.mil/work-with-us/opportunities
Brief Description: The Defense Sciences Office at the Defense Advanced Research Projects Agency (DARPA) is soliciting innovative research proposals in the area of photon detection. Proposed research should investigate innovative approaches that enable revolutionary advances in the modeling and fabrication of photon detectors. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice.
Awards: Various.
Letter of Intent: Contact BAA Coordinator; Detect@darpa.mil
Deadline: March 29, 2016.

Grant Program: Minerva Research Initiative
Agency: Department of Defense WHS-AD-FOA-16-01
RFP Website: http://minerva.dtic.mil
Brief Description: Just as the Cold War gave rise to new ideas and fields of study such as game theory and Kremlinology, the challenges facing the world today call for a broader conception and application of national power that goes beyond military capability. The Office of the Secretary of Defense (OSD) is interested in receiving proposals for the Minerva Research Initiative (http://minerva.dtic.mil), a university-led defense social science program seeking fundamental understanding of the social and cultural forces shaping U.S. strategic interests globally. The Minerva Research Initiative (Minerva) emphasizes questions of strategic importance to U.S. national security policy. It seeks to increase the Department's intellectual capital in the social sciences and improve its ability to address future challenges and build bridges between the Department and the social science community. Minerva brings together universities and other research institutions around the world and supports multidisciplinary and cross-institutional projects addressing specific topic areas determined by the Department of Defense. The Minerva program aims to promote research in specific areas of social science and to promote a candid and constructive relationship between DoD and the social science academic community. The Minerva Research Initiative competition is for research related to the five (5) topics and associated subtopics listed below. Innovative white papers and proposals related to these research topics are highly encouraged. Detailed descriptions of the topics can be found in Section IX, "Specific Minerva Research Initiative Topics." I. Identity, Influence, and Mobilization Culture, identity, and security Influence and mobilization for change II. Contributors to Societal Resilience and Change Governance and rule of law Migration and urbanization Populations and demographics Environment and natural resources Economics III. Power and Deterrence Global order Power projection and diffusion Beyond conventional deterrence Area studies IV. Analytical methods and metrics for security research V. Innovations in National Security, Conflict, and Cooperation Proposals will be considered both for single-investigator awards as well as larger teams. A team of university investigators may be warranted because the necessary expertise in addressing the multiple facets of the topics may reside in different universities, or in

different departments of the same university. The research questions addressed should extend across a fairly broad range of linked issues where there is clear potential synergy among the contributions of the distinct disciplines represented on the team. Team proposals must name one Principal Investigator as the responsible technical point of contact. Similarly, one institution will be the primary recipient for the purpose of award execution. The relationship among participating institutions and their respective roles, as well as the apportionment of funds including sub-awards, if any, must be described in both the proposal text and the budget. The Minerva Research Initiative is a multi-service effort. Ultimately, however, funding decisions will be made by OSD personnel, with technical inputs from the Services.
Awards: Up to $5,000,000. Minimum: $150,000
Letter of Intent: Contact BAA Coordinator; osd.minerva@mail.mil
Deadline: June 17, 2016

Grant Program: Industry Partnerships for Cybersecurity of Energy Delivery Systems (CEDS) Research
Agency: Department of Energy National Energy Technology Laboratory DE-FOA-0001441
RFP Website: https://www.fedconnect.net/fedconnect/?doc=DE-FOA-0001441&agency=DOE
Brief Description: The Department of Energy's (DOE's) National Energy Technology Laboratory (NETL) on behalf of the Office of Electricity Delivery and Energy Reliability (OE) is seeking applications under this Funding Opportunity Announcement (FOA), herein referred to as Announcement, to conduct research, development and demonstrations (RD&D). This RD&D will lead to next generation tools and technologies that will become widely adopted to enhance and accelerate deployment of cybersecurity capabilities for the U.S energy infrastructure, including cyber secure integration of smart grid technologies.

The Cybersecurity for Energy Delivery Systems Program (CEDS) within the Power Systems Engineering Research and Development (PSE R&D) Division of the Office of Electricity Delivery and Energy Reliability (OE) is conducting this Announcement seeking innovative cybersecurity defense approaches for the energy sector. The CEDS program has established partnerships over the past several years throughout the energy sector, government, national laboratories and universities to reduce the risk of energy delivery disruption resulting from a cyber event.

The CEDS program desires to advance cybersecurity technology that aligns with the strategic framework of the Roadmap to Achieve Energy Delivery Systems Cybersecurity [1], herein referred to as Roadmap. The DOE's Office of Electricity Delivery and Energy Reliability, in collaboration with the U.S. Department of Homeland Security's Science and Technology Directorate and Energy Sector Control Systems Working Group (ESCSWG) in support of the Electricity Sub-sector Coordinating Council, Oil and Natural Gas Sector Coordinating Council, and the Government Coordinating Council for Energy under the Critical Infrastructure Partnership Advisory Council (CIPAC) Framework, facilitated the development of the Roadmap. The Roadmap synthesizes expert input from the energy delivery control systems community, including owners and operators, commercial vendors, national laboratories, industry associations, and government agencies. The Roadmap presents a strategic framework supported by key milestones that once met will achieve the Roadmap vision that by 2020 resilient energy delivery systems are designed, installed, operated and maintained to survive a cyber-incident while sustaining critical functions.

[1] (www.controlsystemsroadmap.net)

Awards: Up to $4,000,000.
Letter of Intent: Contact BAA Coordinator; anne.cary@netl.doe.gov
Deadline: March 22, 2016

Grant Program: Synchrophasor Applications and Tools for Reliability, Market Efficiency, and Asset Management
Agency: Department of Energy DE-FOA-0001476
RFP Website:
https://www.fedconnect.net/FedConnect/PublicPages/PublicSearch/Public_Opportunities.aspx
Brief Description: The anticipated purpose of the FOA is to advance the deployment of production-grade software applications that rely on synchrophasor data to enhance the reliability or improve the economic efficiency of bulk power system planning and operations. Under the expected FOA, applicants may propose to conduct pre-commercial research including prototype development, demonstration, and field-testing with a utility or transmission operator host that is prepared to commit to subsequently fund and take delivery of the production-grade commercial implementation of an advanced synchrophasor application. Emphasis is expected to be on, but not be limited to, wide-area applications that involve data collected from more than one utility or transmission operator, including both real-time and off-line applications. It is expected that applications may include, but not be limited to, monitoring and visualization for improved control room operations, wide-area control and protection, power system restoration, power plant model validation, state estimation, renewable integration, and automated methods for detecting and/or diagnosing equipment misoperations (generator or transmission).
Awards: Up to $5,000,000. Minimum: $150,000
Letter of Intent: Contact BAA Coordinator; osd.minerva@mail.mil

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Grant Program: Fiscal Year 2016 Vehicle Technologies Program Wide Funding Opportunity Announcement
Agency: Department of Energy DE-FOA-0001384
RFP Website: https://eere-exchange.energy.gov
Brief Description: Amendment 000001 to DE-FOA-0001384. To view the changes associated with this amendment, please refer to the EERE Exchange website. The Office of Energy Efficiency and Renewable Energy is issuing, on behalf of the Vehicle Technologies Office, this Funding Opportunity Announcement, entitled Fiscal Year 2016 Vehicle Technologies Program Wide Funding Opportunity Announcement. This Funding Opportunity Announcement supports a broad portfolio of advanced highway transportation technologies that reduce petroleum consumption and greenhouse gas emission, while meeting or exceeding vehicle performance and cost expectations. Projects will focus on reducing the cost and improving the performance of a mix of near-and-long-term vehicle technologies. Activities will contribute to achieving the goals of the EV Everywhere Grand Challenge, with a focus on accelerating the development of advanced batteries, power electronics, and lightweight materials technologies, while also supporting technology development to reduce petroleum consumption through advancements in combustion engines, alternative fuels, and other enabling technologies. The Funding Opportunity Announcement also supports Clean Cities initiatives to overcome market barriers. The full Funding Opportunity Announcement is posted on the EERE eXCHANGE website at https://eere-exchange.energy.gov. Applications must be submitted through the EERE

eXCHANGE website to be considered for award. Information on where to submit questions regarding the content of the announcement and where to submit questions regarding submission of applications is found in the full FOA posted on the EERE Exchange website.
Awards: Up to $3,750,000. Minimum: $500,000
Letter of Intent: Contact BAA Coordinator; osd.minerva@mail.mil
Deadline: Mar 28, 2016 Please refer to the FOA for application and submission deadline Information. The FOA is contained in the EERE eXHANGE system.