

NJIT Research Newsletter

Issue: ORN-2016-09

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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: Samuel Leiber (PI)

Department: Engineering and Technology

Grant/Contract Project Title: Crozier Fine Arts Plant Automation

Funding Agency: Crozier Fine Arts, Inc.

Duration: 05/01/16-08/01/16

PI: Suzanne Berliner-Heyman (PI)

Department: Pre-College Programs

Grant/Contract Project Title: Exxon Mobil/Bernard Harris Summer Science Camp 2016

Funding Agency: Exxon Mobil Harris Foundation

Duration: 02/01/16-02/01/17

PI: Suzanne Berliner-Heyman (PI)

Department: Pre-College Programs

Grant/Contract Project Title: Unite Program

Funding Agency: Unite Foundation (Army)

Duration: 03/01/16-12/01/16

PI: Suzanne Berliner-Heyman (PI)

Department: Pre-College Programs

Grant/Contract Project Title: Victoria Foundation Grant

Funding Agency: Victoria Foundation

Duration: 03/01/16-12/31/16

Events and Announcements

Event: NSF Webinar: The Automated-Reasoning Revolution: From Theory to Practice and Back

When: March 9, 2016: 2.00 PM – 3.00 PM

Where: http://www.nsf.gov/events/event_summ.jsp?cntn_id=137828&org=NSF

Brief Description: For the past 40 years computer scientists generally believed that NP-complete problems are intractable. In particular, Boolean satisfiability (SAT), as a paradigmatic automated-reasoning problem, has been considered to be intractable. Over the past 20 years, however, there has been a quiet, but dramatic, revolution, and very large SAT instances are now being solved routinely as part of software and hardware design. In this talk I will review this amazing development and show how automated reasoning is now an industrial reality. I will then show describe how we can leverage SAT solving to accomplish other automated-reasoning tasks. Counting the number of satisfying truth assignments of a given Boolean formula or sampling such assignments uniformly at random are fundamental computational problems in computer science with applications in software testing, software synthesis, machine learning, personalized learning, and more. While the theory of these problems has been thoroughly investigated since the 1980s, approximation algorithms developed by theoreticians do not scale up to industrial-sized instances. Algorithms used by the industry offer better scalability, but give up certain correctness guarantees to achieve scalability. We describe a novel approach, based on universal hashing and Satisfiability Modulo Theory, which scales to formulas with hundreds of thousands of variable without giving up correctness guarantees.

Speaker Bio: Moshe Y. Vardi is the George Distinguished Service Professor in Computational Engineering and Director of the Ken Kennedy Institute for Information Technology at Rice University. He is the recipient of three IBM Outstanding Innovation Awards, the ACM SIGACT Gödel Prize, the ACM Kanellakis Award, the ACM SIGMOD Codd Award, the Blaise Pascal Medal, the IEEE Computer Society Goode Award, the EATCS Distinguished Achievements Award, and the Southeastern Universities Research Association's Distinguished Scientist Award. He is the author and co-author of over 500 papers, as well as two books: "Reasoning about Knowledge" and "Finite Model Theory and Its Applications". He is a Fellow of the Association for Computing Machinery, the American Association for Artificial Intelligence, the American Association for the Advancement of Science, the European Association for Theoretical Computer Science, the Institute for Electrical and Electronic Engineers, and the Society for Industrial and Applied Mathematics. He is a member of the US National Academy of Engineering and National Academy of Science, the American Academy of Arts and Science, the European Academy of Science, and Academia Europaea. He holds honorary doctorates from the Saarland University in Germany, Orleans University in France, and UFRGS in Brazil. He is the Editor-in-Chief of the Communications of the ACM.

Register: Please register 11:59pm EST on Tuesday, March 8, 2016:

<https://nsf.webex.com/nsf/j.php?RGID=r35e52abc8dc1b8d681d1d20b122fe67f>

Grant Opportunity Alerts

Keywords and Areas Included in Grant Opportunity Alerts:

NSF: Innovation Corps- National Innovation Network Sites Program (I-Corps Sites); Innovation Corps - National Innovation Network Nodes Program (I-Corps Nodes); Materials Research Science and Engineering Centers; NSF Scholarships in Science, Technology, Engineering, and

Mathematics (S-STEM); Conferences and Workshops in the Mathematical Sciences; Cyber-Physical Systems (CPS); Science Learning+ Partnership Grants
NIH: Research Initiative for Scientific Enhancement (RISE) (R25); Bioengineering Research Partnerships (U01)
Department of Defense/US Army/DARPA/ONR: DoD Breast Cancer Innovator Award; Breast Cancer Breakthrough Award Levels 1 and 2
Foundations: Bill & Melinda Gate Foundation Grand Challenges

Grant Opportunities

National Science Foundation

Internal Competition for Limited Submission Opportunities:

Grant Program: Innovation Corps- National Innovation Network Sites Program (I-Corps Sites)

Agency: National Science Foundation NSF 16-547

RFP Website: <http://www.nsf.gov/pubs/2016/nsf16547/nsf16547.htm>

Brief Description: The National Science Foundation (NSF) seeks to develop and nurture a national innovation ecosystem that builds upon research to guide the output of scientific discoveries closer to the development of technologies, products and processes that benefit society.

In order to contribute to a national innovation ecosystem, NSF established the NSF Innovation Corps Sites Program (NSF I-Corps Sites). Sites are funded at academic institutions, having already existing innovation or entrepreneurial units, to enable them to:

- Nurture students and/or faculty who are engaged in projects having the potential to be transitioned into the marketplace. I-Corps Sites will provide infrastructure, advice, resources, networking opportunities, training and modest funding to enable groups to transition their work into the marketplace or into becoming [I-Corps Team applicants](#).
- Develop formal, active, local innovation ecosystems that contribute to a larger, national network of mentors, researchers, entrepreneurs and investors. Networking is an essential component of all of NSF's I-Corps activities – local and national networking activities help advance the goals of I-Corps and contribute to local and national ecosystems for innovation.

The purpose of an I-Corps Site is to nurture and support multiple, local teams to transition their ideas, devices, processes or other intellectual activities into the marketplace.

Awards: Up to 25 I-Corps Sites awards annually, pending availability of funds.

Limited Submission: An Institution may submit one proposal.

Institutional Internal Competition Submission: Interested faculty must submit an Internal Letter of Intent (up to three pages) to Atam Dhawan, Vice Provost of Research through their College/School dean no later than **March 10, 2016**. The Letter of Intent should have the following sections:

1. Executive Summary and Goals of the Project
2. Intellectual Merit
3. Broader Impact
4. Collaborators and Type of Projects
5. Available Resources
6. Overall Proposal Budget Estimate

Letter of Intent to NSF: Not Required
Full Proposal Deadlines: May 25, 2016
Contacts:

- Anita J. La Salle, telephone: (703) 292-5006, email: alasalle@nsf.gov
 - Lydia V. McClure, telephone: (703) 292-8050, email: lmccclure@nsf.gov
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Grant Program: Innovation Corps - National Innovation Network Nodes Program
Agency: National Science Foundation NSF 16-539

RFP Website: <http://www.nsf.gov/pubs/2016/nsf16539/nsf16539.htm>

Brief Description: The National Science Foundation (NSF) seeks to further develop and nurture a national innovation ecosystem that builds upon fundamental research to guide the output of scientific discoveries closer to the development of technologies, products, processes and services that benefit society. The goal of the program is to dramatically reduce the period of time necessary to bring a promising idea from its inception to widespread implementation. Through this solicitation, NSF plans to build upon the established National Innovation Network (consisting of I-Corps Nodes and Sites) to further support the needs for innovation research, education and training. NSF is seeking to expand and sustain the network of I-Corps Nodes that work cooperatively to support the development of innovations that will benefit society. The interconnected nodes of the network are expected to be diverse in research areas, resources, tools, programs, capabilities, and geographic locations - providing the network with the flexibility to grow or reconfigure as needs arise.

I-Corps Nodes will foster understanding on how to: 1) identify, develop and support promising ideas that can generate value, 2) create and implement tools, resources and training activities that enhance our nation's innovation capacity, 3) gather, analyze, evaluate and utilize the data and insight resulting from the experiences of those participating in regional programs and 4) share and leverage effective innovation practices on a national scale - to improve the quality of life for the U.S. citizenry. In addition, Nodes must identify and are expected to implement plans for sustainable scaling of their efforts beyond the duration of NSF support.

Please Note: The solicitation has been modified to now include two tracks:

- **Track 1: I-Corps Node Development** - new I-Corps Node applicants, and
- **Track 2: I-Corps Node Renewal** - previously funded I-Corps Nodes.

Award amounts have changed, and are no longer dependent upon the number of institutions participating in the Node.

Awards: Approximately 4 - 7 awards are anticipated.

Track 1: *I-Corps Node Development* - new I-Corps Node awardees - to be supported at a level of up to:

- \$1,200,000 (years 1 and 2)
- \$900,000 (year 3)
- \$600,000 (year 4)
- \$300,000 (year 5)

Track 2: *I-Corps Node Renewal* - previously funded I-Corps Nodes - to be supported at a level of up to:

- \$900,000 (years 1 and 2)
- \$750,000 (year 3)
- \$600,000 (year 4)
- \$300,000 (year 5)

Letter of Intent: A Letter of Intent (LOI) MUST be submitted by the Authorized Organizational Representative (AOR) for either a Track 1 or Track 2 proposal in order to be considered for

funding. Full proposals that are submitted without a LOI (that had been received by the appropriate deadline) will be returned without review (RWR). **Deadline: March 10, 2016**

Full Proposal Deadlines: May 10, 2016

Contacts:

- Rathindra DasGupta, telephone: (703) 292-8353, email: rdasgupt@nsf.gov
 - Lydia McClure, telephone: (703) 292-8798, email: lmclure@nsf.gov
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Grant Program: Materials Research Science and Engineering Centers

Agency: National Science Foundation NSF 16-545

RFP Website: <http://www.nsf.gov/pubs/2016/nsf16545/nsf16545.htm>

Brief Description: Materials Research Science and Engineering Centers (MRSECs) provide sustained support of interdisciplinary materials research and education of the highest quality while addressing fundamental problems in science and engineering. MRSECs address research of a scope and complexity requiring the scale, synergy, and interdisciplinarity provided by a campus-based research center. They support materials research infrastructure in the United States, promote active collaboration between universities and other sectors, including industry and international institutions, and contribute to the development of a national network of university-based centers in materials research, education, and facilities. A MRSEC may be located at a single institution, or may involve multiple institutions in partnership.

Awards: The number of MRSEC awards will depend on the quality of the proposals and available funds. An estimate of \$23M will be available for the FY 2017 competition for funding approximately 6 to 8 MRSEC awards.

Limited Submission: Only one MRSEC preliminary proposal may be submitted by any one organization as the lead institution in this competition. An institution proposing research in several groups should submit a single MRSEC proposal with multiple Interdisciplinary Research Groups (IRGs). A MRSEC proposal must contain a minimum of 2 IRGs and a maximum of 3 IRGs. The IRGs in a center may be thematically related, or they may address different aspects of materials research. A single center at an organization allows efficient usage of resources, including common infrastructure, and better coordination of education and other activities of the center.

Institutional Internal Competition Submission: Interested faculty must submit an Internal Letter of Intent (up to three pages) to Atam Dhawan, Vice Provost of Research through their College/School dean no later than **April 2, 2016**. The Letter of Intent should have the following sections:

1. Executive Summary and Goals of the Project
2. Intellectual Merit
3. Broader Impact
4. Collaborators and Interdisciplinary Projects
5. Available Resources
6. Overall Proposal Budget Estimate

Letter of Intent to NSF: Not Required

Preliminary Proposal Due Date: July 01, 2016

Full Proposal Deadlines: December 02, 2016

Contacts:

- Daniele Finotello, 1065 N, telephone: (703) 292-4676, email: dfinotel@nsf.gov
 - Alfredo Caro, 1065 N, telephone: (703) 292-4914, email: jcaro@nsf.gov
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Grant Program: NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM)

Agency: National Science Foundation NSF 16-540

RFP Website: <http://www.nsf.gov/pubs/2016/nsf16540/nsf16540.htm>

Brief Description: A well-educated science, technology, engineering, and mathematics (STEM) workforce is a significant contributor to maintaining the competitiveness of the U.S. in the global economy. The National Science Foundation (NSF) Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) program addresses the need for a high quality STEM workforce in STEM disciplines supported by the program and for the increased success of low-income academically talented students with demonstrated financial need who are pursuing associate, baccalaureate, or graduate degrees in science, technology, engineering, and mathematics (STEM).

Recognizing that financial aid alone cannot increase retention and graduation in STEM, the program provides awards to Institutions of Higher Education (IHEs) to fund scholarships and to advance the adaptation, implementation, and study of effective evidence-based curricular and co-curricular activities that support recruitment, retention, transfer (if appropriate), student success, academic/career pathways, and graduation in STEM. The S-STEM program encourages collaborations among different types of partners: Partnerships among different types of institutions; collaborations of STEM faculty and institutional, educational, and social science researchers; and partnerships among institutions of higher education and local business and industry, if appropriate.

The program seeks: 1) to increase the number of low-income academically talented students with demonstrated financial need obtaining degrees in STEM and entering the workforce or graduate programs in STEM; 2) to improve the education of future scientists, engineers, and technicians, with a focus on academically talented low-income students; and 3) to generate knowledge to advance understanding of how factors or evidence-based curricular and co-curricular activities affect the success, retention, transfer, academic/career pathways, and graduation in STEM of low-income students.

The STEM disciplines supported by the S-STEM program include:

- Biological sciences (except medicine and other clinical fields);
- Physical sciences (including physics, chemistry, astronomy, and materials science);
- Mathematical sciences;
- Computer and information sciences;
- Geosciences;
- Engineering; and

Technology areas associated with the preceding disciplines (for example, biotechnology, chemical technology, engineering technology, information technology, etc.).

Awards: \$70,000,000 to \$95,000,000 annually, for new and continuing awards, subject to availability of funds. The program supports three types of projects. Awards for Strand 1 - Institutional Capacity Building projects may not exceed \$650,000. Awards for Strand 2 - Design and Development Type 1 Single Institution projects may not exceed \$1.0 million. Awards for Strand 2 - Design and Development Type 2 Multi-Institutional Consortia projects may not exceed \$5.0 million. In all cases, the totals are inclusive of direct and indirect costs.

Limited Submission: An Institution may submit one proposal (either as a single institution or as subawardee or a member of a Collaborative Research project) from each constituent school or college that awards degrees in an eligible field. See Additional Eligibility Information below for more details.

Institutional Internal Competition Submission: Interested faculty must submit an Internal Letter of Intent (up to three pages) to Atam Dhawan, Vice Provost of Research through their

College/School dean no later than **March 10, 2016**. The Letter of Intent should have the following sections:

7. Executive Summary and Goals of the Project
8. Intellectual Merit
9. Broader Impact
10. Collaborators
11. Available Resources
12. Overall Proposal Budget Estimate

Letter of Intent to NSF: Not Required

Full Proposal Deadlines: May 16, 2016

Contacts:

- Connie K. Della-Piana, telephone: (703) 292-5309, email: cdellapi@nsf.gov
 - Paul Tymann, telephone: (703) 292-2260, email: ptymann@nsf.gov
 - John Krupczak, telephone: (703) 292-4647, email: jkrupcza@nsf.gov
 - Yvette P. Weatherton, telephone: (703) 292-5323, email: yweather@nsf.gov
 - Kevin Lee, telephone: (703) 292-4639, email: kelee@nsf.gov
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Other NSF Grant Opportunities

Grant Program: Conferences and Workshops in the Mathematical Sciences

Agency: National Science Foundation NSF 16-550

RFP Website: <http://www.nsf.gov/pubs/2016/nsf16550/nsf16550.htm>

Brief Description: Conferences, workshops, and related events (including seasonal schools and international travel by groups) support research and training activities of the mathematical sciences community. Proposals for conferences, workshops, or conference-like activities may request funding of any amount and for durations of up to three years. Proposals under this solicitation must be submitted to the appropriate DMS programs in accordance with the lead-time requirements specified on the program web page.

Awards: Standard Grants.

Letter of Intent: Not Required

Full Proposal Submission Due Date: Proposals must be submitted with sufficient lead time, in accordance with the guidance provided by the disciplinary program to which the proposal is submitted.

Contacts:

- Tomek Bartoszynski, telephone: (703) 292-4885, email: tbartosz@nsf.gov
 - Mary Ann Horn, telephone: (703) 292-4879, email: mhorn@nsf.gov
 - Joanna Kania-Bartoszynska, telephone: (703) 292-4881, email: jkaniaba@nsf.gov
 - Tie Luo, telephone: (703) 292-8448, email: tluo@nsf.gov
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Grant Program: Cyber-Physical Systems (CPS)

Agency: National Science Foundation NSF 16-549

RFP Website: <http://www.nsf.gov/pubs/2016/nsf16549/nsf16549.htm>

Brief Description: Cyber-physical systems (CPS) are engineered systems that are built from, and depend upon, the seamless integration of computational algorithms and physical components. Advances in CPS will enable capability, adaptability, scalability, resiliency, safety, security, and usability that will far exceed the simple embedded systems of today. CPS technology will transform the way people interact with engineered systems – just as the

Internet has transformed the way people interact with information. New smart CPS will drive innovation and competition in sectors such as agriculture, energy, transportation, building design and automation, healthcare, and manufacturing.

The December 2010 report of the President's Council of Advisors on Science and Technology (PCAST) titled [*Designing a Digital Future: Federally Funded Research and Development in Networking and Information Technology*](#) calls for continued investment in CPS research because of its scientific and technological importance as well as its potential impact on grand challenges in a number of sectors critical to U.S. security and competitiveness such as the ones noted above. These challenges and technology gaps are further described in a [*CPS Vision Statement*](#) published in 2012 by the federal Networking and Information Technology Research and Development (NITRD) CPS Senior Steering Group.

Tremendous progress has been made in advancing CPS technology over the last five-plus years. We have explored foundational technologies that have spanned an ever-growing set of application domains, enabling breakthrough achievements in many of these fields. At the same time, the demand for innovation in these domains continues to grow, and is driving the need to accelerate fundamental research to keep pace.

Despite significant inroads into CPS technology in recent years, we do not yet have a mature science to support systems engineering of high-confidence CPS, and the consequences are profound. Traditional analysis tools are unable to cope with the full complexity of CPS or adequately predict system behavior. For example, as the Internet of Things (IoT) scales to billions of connected devices – with the capacity to sense, control, and otherwise interact with the human and physical world – the requirements for dependability, security, safety, and privacy grow immensely. One barrier to progress is the lack of appropriate science and technology to conceptualize and design for the deep interdependencies among engineered systems and the natural world. The challenges and opportunities for CPS are thus significant and far-reaching. New relationships between the cyber and physical components require new architectural models that redefine form and function. They integrate the continuous and discrete, compounded by the uncertainty of open environments. Traditional real-time performance guarantees are insufficient for CPS when systems are large and spatially, temporally, or hierarchically distributed in configurations that may rapidly change. With the greater autonomy and cooperation possible with CPS, greater assurances of safety, security, scalability, and reliability are demanded, placing a high premium on open interfaces, modularity, interoperability, and verification.

The goal of the CPS program is to develop the core system science needed to engineer complex cyber-physical systems that people can use or interact with and depend upon. Some of these may require high-confidence or provable behaviors. The program aims to foster a research community committed to advancing research and education in CPS and to transitioning CPS science and technology into engineering practice. By abstracting from the particulars of specific systems and application domains, the CPS program seeks to reveal cross-cutting fundamental scientific and engineering principles that underpin the integration of cyber and physical elements across all application sectors. To expedite and accelerate the realization of cyber-physical systems in a wide range of applications, the CPS program also supports the development of methods, tools, and hardware and software components based upon these cross-cutting principles, along with validation of the principles via prototypes and testbeds. We have also seen a convergence of CPS technologies and research thrusts that underpin Smart & Connected Communities (S&CC) and the Internet of Things (IoT). These domains offer new and exciting challenges for foundational research and provide opportunities for maturation at multiple time horizons.

In 2016, NSF is working closely with multiple agencies of the federal government, including the U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T); the U.S. Department of Transportation (DOT) Federal Highway Administration (FHWA), and through FHWA, the U.S. DOT Intelligent Transportation Systems (ITS) Joint Program Office (JPO); the National Aeronautics and Space Administration (NASA) Aeronautics Research Mission Directorate (ARMD); several National Institutes of Health (NIH) institutes and centers [including the National Institute of Biomedical Imaging and Bioengineering (NIBIB), Office of Behavioral and Social Sciences Research (OBSSR), National Cancer Institute (NCI), and National Center for Advancing Translational Sciences (NCATS)]; and the U.S. Department of Agriculture-National Institute of Food and Agriculture (USDA-NIFA, hereafter referred to as NIFA). Key goals are to identify basic CPS research directions that are common across multiple application domains, along with opportunities for accelerated transition to practice.

Three classes of research and education projects – differing in scope and goals – will be considered through this solicitation:

- **Breakthrough** projects must offer a significant advance in fundamental CPS science, engineering and/or technology that has the potential to change the field. This category focuses on new approaches to bridge computing, communication, and control. Funding for Breakthrough projects may be requested for a total of up to \$500,000 for a period of up to 3 years.
- **Synergy** projects must demonstrate innovation at the intersection of multiple disciplines, to accomplish a clear goal that requires an integrated perspective spanning the disciplines. Funding for Synergy projects may be requested for a total of \$500,001 to \$1,000,000 for a period of 3 to 4 years.
- **Frontier** projects must address clearly identified critical CPS challenges that cannot be achieved by a set of smaller projects. Funding may be requested for a total of \$1,000,001 to \$7,000,000 for a period of 4 to 5 years.

Awards: Approximately 10 Breakthrough projects, 20 Synergy projects, and 2 Frontier projects are anticipated, subject to receipt of sufficient meritorious proposals. Anticipated Funding Amount: \$34,000,000

Letter of Intent: Not Required

Full Proposal Submission Due Date: May 24, 2016 - June 07, 2016

Contacts:

- David Corman, Program Director, CISE/CNS, 1175, telephone: (703) 292-8754, email: dcorman@nsf.gov
- Radhakisan Baheti, Program Director, ENG/ECCS, 525, telephone: (703) 292-8339, email: rbaheti@nsf.gov
- Sankar Basu, Program Director, CISE/CCF, telephone: (703) 292-7843, email: sabasu@nsf.gov

Grant Program: Science Learning+ Partnership Grants

Agency: National Science Foundation NSF 16-548

RFP Website: <http://www.nsf.gov/pubs/2016/nsf16548/nsf16548.htm>

Brief Description: Within the National Science Foundation (NSF) context, **Science Learning+** is a strand within project type 3, Research in Service to Practice, of the **Advancing Informal STEM Learning (AISL)** program ([NSF 15-593](#)).

Science Learning+ is an open call for proposals for Partnership Grants through an international partnership between the NSF and the Wellcome Trust with the UK Economic and Social Research Council (ESRC).

The aims of Science Learning+ are to strengthen the research and knowledge base; bridge the practice and research gap; and/or share knowledge and experience in informal science, technology, engineering and mathematics (STEM) experiences. Furthermore, the initiative seeks to support practice-based research which falls within or across the following priority areas: understanding learning; engagement in STEM; skills development; equity; diversity; access to informal learning settings; and measurement of outcomes.

Proposals must address at least one priority area and include: collaborations between at least one organization in the US and one in the UK/Republic of Ireland. In addition, the proposal should include a substantive research program, not solely a public engagement activity; genuine partnerships between researchers and practitioners of STEM engagement; experts from more than one STEM area; and more than one informal STEM learning location, platform, or environment. Proposers should submit a single, comprehensive proposal with two budget components, one for US activities and one for UK/Republic of Ireland activities, to NSF.

Awards: Total anticipated funding: \$12 million/£7.5 million; that amount includes approximately \$6,000,000 from NSF, dependent upon availability of appropriations, for new standard or continuing awards and up to £3,750,000 from the Wellcome Trust and ESRC.

Letter of Intent: Not Required

Full Proposal Submission Due Date: June 14, 2016

Contacts:

- Catherine Eberbach, telephone: (703) 292-4960, email: ceberbac@nsf.gov
- Ellen McCallie, telephone: (703) 292-5115, email: emccalli@nsf.gov
- Mat Hickman, Wellcome Trust, telephone: +44 (0)20 7611 8825, email: m.hickman@wellcome.ac.uk
- Ann Jeffcott, ESRC, telephone: +44 (0)17 9341 3023, email: ann.jeffcott@esrc.ac.uk

National Institutes of Health

Grant Program: Research Initiative for Scientific Enhancement (RISE) (R25)

Agency: National Institutes of Health PAR-16-118

RFP Website: <http://grants.nih.gov/grants/guide/pa-files/PAR-16-118.html>

Brief Description: The NIH Research Education Program (R25) supports research educational activities that complement other formal training programs in the mission areas of the NIH Institutes and Centers. The over-arching goals of the NIH R25 program are to: (1) complement and/or enhance the training of a workforce to meet the nation's biomedical, behavioral and clinical research needs; (2) enhance the diversity of the biomedical, behavioral and clinical research workforce; (3) help recruit individuals with specific specialty or disciplinary backgrounds to research careers in biomedical, behavioral and clinical sciences; and (4) foster a better understanding of biomedical, behavioral and clinical research and its implications.

The over-arching goal of this NIGMS R25 program is to support educational activities enhance the diversity of the biomedical, behavioral and clinical research workforce.. To accomplish the stated over-arching goal, this FOA will support creative educational activities with a primary focus on:

- **Research Experiences:** For example, for undergraduate students: to provide hands-on exposure to research, to reinforce their intent to graduate with a science degree, and/or to prepare them for graduate school admissions and/or careers in research; for graduate students: to provide research experiences and related training..

- **Courses for Skills Development:** For example, advanced courses in a specific discipline or research area, clinical procedures for research, or specialized research techniques.

The overarching goal of the program is to significantly increase the number of students from underrepresented groups who successfully complete baccalaureate and Ph.D. biomedical degrees. In doing so, the overarching expectation is that through its support of new and ongoing institutionally-designed student and faculty developmental programs, the RISE Program will help reduce the gap in the completion of Ph.D. degrees between UR and non-UR students in the biomedical sciences at the national level. At the institutional level, programs will provide educational experiences that enhance diversity in the context of their specific environment. It is expected that the following objectives will be achieved:

- An increase in the overall number of UR students that complete a Ph.D. and continue biomedical research careers;
- At least 50% of undergraduate (UG) and 75% of master's RISE-supported students will enter into a Ph.D. program within three years after graduation; and
- At least 80% of RISE-supported Ph.D. students will complete the degree.

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

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

Letter of Intent: Not Required.

Deadline: May 25, 2016; May 25, 2017; and May 25, 2018, by 5:00 PM local time of applicant organization. All types of 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: Bioengineering Research Partnerships (U01)

Agency: National Institutes of Health PAR-16-116

RFP Website: <http://grants.nih.gov/grants/guide/pa-files/PAR-16-116.html>

Brief Description: The goal of a Bioengineering Research Partnership (BRP) is to drive the development and speed the adoption of promising tools and technologies that can address important biomedical problems for which insufficient or no solutions exist. The use of engineering principles is encouraged to establish these tools and technologies as robust, well-characterized solutions that fulfill an unmet need. A synergistic partnership between engineering and the life, physical, and computational sciences is also encouraged, where the unique skills of each discipline combine to enhance our understanding of life science processes or the practice of medicine.

The purpose of this FOA is to encourage BRP applications that: 1) establish a robust engineering solution to a problem in biomedical research or the practice of medicine; 2) develop a strategic alliance of multidisciplinary partners based on a well-defined leadership plan; and 3) realize a specific endpoint within 5-10 years based on a detailed plan with a timeline and quantitative milestones.

The primary objective of this FOA is to encourage basic, applied, or clinical bioengineering solutions to unmet needs in biological or biomedical research and clinical practice that can enhance the capabilities of end-users to improve our understanding of life

science processes or the practice of medicine within 5 – 10 years. A BRP may bring together new or existing technologies to form creative solutions that have the potential to be widely adopted and improve human health. To deliver practical solutions within this timeframe, applicants are encouraged to use a design-directed research strategy with well-defined end goal(s) and intermediate, quantitative milestones. Goals may include, but are not limited to, establishing proof of concept, pre-commercial prototype production, licensure, release of software packages, designs or models, demonstrating the biological effectiveness of engineered constructs, elucidating the structural and functional relevance of biomolecules or tissues, first-in-human testing, or starting the investigational device exemption or investigational new drug process.

A second key objective is to encourage collaborations and partnerships among allied quantitative and biomedical disciplines. The value of strategic partnerships is well supported by the literature of both economics and science and technology policy, which documents greater success at research and development by groups that work in strategic alliances, often involving multiple institutions, compared to those working separately. In addition to the benefits to be derived from the research, the collaborations and partnerships can create opportunities for trans-disciplinary communication and training of a new generation of scientists who are capable of interacting across traditional technical boundaries. A Partnership typically consists of two to six partners from multiple institutions or multiple departments from the same institution, with each partner bringing critical strengths to the project. The team may require experience in technology development, appropriate model systems for validation, human factors research, regulatory approval, project management or commercialization to realize and disseminate a robust solution. Potential beneficiaries should be active participants in the partnership from the beginning, to provide assurance that proposed solutions will meet community needs. Partnerships with companies that have relevant expertise or may eventually engage in future commercialization or with organizations that can test and disseminate technologies are encouraged under the BRP program. Each PD/PI or collaborator is expected to provide substantive contributions to the intellectual or technical aspects of the project, and should be clearly differentiated from team members who supply necessary but not unique components or services.

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

Letter of Intent: Not required.

Deadline: May 18, 2016, September 13, 2016, May 18, 2017, September 13, 2017, May 8, 2018, September 13, 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.

Department of Defense/US Army/DARPA/ONR

Grant Program: DoD Breast Cancer Innovator Award

Agency: AFOSR - Department of Defense Dept. of the Army -- USAMRAA W81XWH-16-BCRP-INNOV

RFP Website: <http://www.federalgrants.com/DoD-Breast-Cancer-Innovator-Award-56111.html>

Brief Description: The Innovator Award supports visionary individuals who have demonstrated exceptional creativity, innovative work, and paradigm-shifting leadership in any

field including, but not limited to, breast cancer. The Innovator Award will provide these individuals with the funding and freedom to pursue their most novel, visionary, high-risk ideas that could accelerate progress to ending breast cancer.

Because the intent of the Innovator Award mechanism is to recognize these remarkably creative and innovative, visionary individuals rather than projects, the central feature of the award is the innovative contribution that the Principal Investigator (PI) can make toward ending breast cancer. The PI should have a record of challenging the status quo, shifting paradigms by changing a field of research or approach to patient care, exhibiting high levels of creativity, and demonstrating promise for continued innovation in future work. These rare individuals will be able to articulate a vision for ending breast cancer that challenges current dogma and demonstrates an ability to look beyond tradition and convention. The PI is also expected to be established in his/her field and have demonstrated success at forming and leading effective partnerships and collaborations. To further the development of innovative individuals and spark the generation of novel ideas, applications are required to incorporate the mentoring of promising junior investigators.

Experience in breast cancer research is not required; however, the application must focus on breast cancer, and the PI must maintain a 50% dedication of his/her full-time professional effort during the award period to breast cancer research. This professional effort in breast cancer research can be through a combination of this award and other current support. Individuals from other disciplines who will apply novel concepts to breast cancer are encouraged to submit.

The PI is expected to assemble a research team that will provide the necessary expertise and collaborative efforts toward accomplishing the research goals. The PI's research team must include two or more breast cancer consumer advocates. As lay representatives, the consumer advocates must be individuals who have been diagnosed with breast cancer and are actively involved in a breast cancer advocacy organization. Their role should be independent of their employment, and they cannot be employees of any of the organizations participating in the application. The consumer advocates should have a high level of knowledge of current breast cancer issues and the necessary background or training in breast cancer research to contribute to the project. Their role should be focused on providing objective input on the research and its potential impact for individuals with, or at risk for, breast cancer.

Awards: Standard Grants.

Deadline: August 11, 2016

Grant Program: Breast Cancer Breakthrough Award Levels 1 and 2

Agency: AFOSR - Department of Defense Dept. of the Army -- USAMRAA W81XWH-16-BCRP-BREAKTHROUGHFL12

RFP Website: <http://www.federalgrants.com/DoD-Breast-Cancer-Breakthrough-Award-Levels-1-and-2-49823.html>

Brief Description: The intent of the Breakthrough Award is to support promising research that has high potential to lead to or make breakthroughs in breast cancer. The critical components of this award mechanism are:

Impact: Research supported by the Breakthrough Award will have the potential for a major impact and accelerate progress toward ending breast cancer. The impact may be near-term or long-term, but must be significant and move beyond an incremental advancement. Applications must articulate the pathway to making a clinical impact for individuals with, or at risk for, breast cancer, even if clinical impact is not an immediate outcome.

Research Scope: Research proposed under this award mechanism may be small- to large-scale projects, at different stages of idea and research development. Two different funding levels, based on the scope of the research, are available under this Program Announcement/Funding Opportunity. Two additional funding levels, Funding Levels 3 and 4, are available under a different Program Announcement (W81XWH-15-BCRP-BREAKTHROUGH_FL34). It is the responsibility of the Principal Investigator (PI) to select the funding level that is most appropriate for the research proposed. The funding level should be selected based on the scope of the research project, rather than the amount of the budget.

The following are general descriptions, although not all-inclusive, of the scope of research projects that would be appropriate to propose under each funding level:

- Funding Level 1: Innovative, high-risk/high-reward research that is in the earliest stages of idea development. Research with potential to yield new avenues of investigation. Proof of concept. No preliminary data required.
- Funding Level 2: Research that is already supported by preliminary data and has potential to make significant advancements toward clinical translation. Demonstration of efficacy in in vivo models, as applicable.

Partnering PI Option: The Breakthrough Award encourages applications that include meaningful and productive collaborations between investigators. The Partnering PI Option is structured to accommodate two PIs, called the Initiating PI and the Partnering PI, each of whom will receive a separate award. The Initiating and Partnering PIs have different submission requirements; however, both PIs should contribute significantly to the development of the proposed research project including the Project Narrative, Statement of Work (SOW), and other required components. The PIs may have expertise in similar or disparate scientific disciplines, but each PI is expected to bring distinct contributions to the application. New collaborations are encouraged, but not required. It is the responsibility of the PIs to describe how their combined expertise will better address the research question and explain why the work should be done together rather than through separate efforts. To meet the intent of the Partnering PI Option, applicants are discouraged from submitting as a Partnering PI on multiple applications unless they are clearly addressing distinct research questions. Applications submitted by a mentor and his/her current postdoctoral fellow or junior investigator as Initiating and Partnering PIs do not meet the intent of the Partnering PI Option..

Awards: Standard Grants.

Deadline: May 05, 2016

Bill and Melinda Gate Foundation

Grant Program: Grand Challenges

Agency: Bill & Melinda Gate Foundation

RFP Website: <http://gcgh.grandchallenges.org>

Brief Description: The Bill & Melinda Gates Foundation and its funding partners in the Grand Challenges family of grant programs are inviting innovators to apply for three grant opportunities:

1) Our [Grand Challenges Explorations](#) fosters early-stage discovery research to expand the pipeline of ideas for solving our greatest global health and development challenges. Launched in 2008 with an initial \$100 million commitment from the foundation, Grand Challenges Explorations grants have already been awarded to more than 1100 researchers from more than 60 countries.

We are accepting applications on the following six topics until **May 11, 2016**:

- [Assess Family Planning Needs, Preferences and Behaviors to Inform Innovations in Contraceptive Technologies and Services](#)
- [Develop Novel Platforms to Accelerate Contraceptive Drug Discovery](#)
- [Design New Analytics Approaches for Malaria Elimination](#)
- [Accelerate Development of New Therapies for Childhood Cryptosporidium Infection](#)
- [Novel Approaches to Characterizing and Tracking the Global Burden of Antimicrobial Resistance](#)
- [Explore New Solutions in Global Health Priority Areas](#)

2) [Grand Challenges China: New Interventions for Global Health](#). This challenge focuses on calls for innovative concepts for safe, effective, affordable and widely utilized interventions, such as vaccines and therapeutics, with the potential to protect against the acquisition, progression or transmission of infectious diseases that disproportionately affect the world's poorest. This call is in partnership with the National Natural Science Foundation of China.

Application deadline is **March 15, 2016, 8:00 am Beijing time (March 14, 2016, 5pm Seattle time)**. For a detailed description of this challenge, please visit the [Grand Challenges site](#).

Proposal Deadline: May 11, 2016 for (1) and March 15, 2016 for (2) above.

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