LEWIS–BURKE ASSOCIATES LLC

**TUFTS UPDATE – JANUARY 11, 2019**
**PREPARED BY LEWIS-BURKE ASSOCIATES LLC**

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## Introduction

This edition of the Tufts Washington Update for late December and early January includes congressional and administration updates, agency updates, and funding opportunities. Faculty, staff, and researchers are welcome to schedule calls with the Lewis-Burke Tufts team or meet with the team when they visit Washington, DC. Contact Amber Cassady, Lewis-Burke Associates LLC, at amber@lewis-burke.com with any questions or comments related to the Update's content or for more information on updates and opportunities.

## Congressional and Administration Updates

### Congress Passes Legislation Establishing a 10-Year National Quantum Initiative

On December 19, Congress passed legislation that would establish a 10-year National Quantum Initiative (NQI). The *National Quantum Initiative Act* (H.R. 6227) is a response to growing concerns that the U.S. would fall behind China and Europe in leveraging the economic and national security opportunities of quantum science and technology. This Lewis-Burke analysis provides a summary of the legislation and future opportunities for institutions of higher education to engage with federal agencies in quantum science and technology.

***The National Quantum Initiative Act***

The main purpose of the legislation is to demonstrate bipartisan, congressional support for making quantum science and technology a national research and development priority, pave the way for a more coordinated, whole-of-government approach to accelerate science discoveries and deployment, and make a long-term commitment (10-years) to this research effort by providing stability of funding. While this legislation provides guidance and direction to the main federal civilian research agencies and organizations involved in quantum science—the Office of Science and Technology Policy (OSTP), National Science Foundation (NSF), National Institute of Standards and Technology (NIST), and Department of Energy (DOE)—it does not include the Department of Defense (DOD) and other defense agencies. The absence of defense agencies in this legislation is primarily due to jurisdictional issues with the congressional committees involved in drafting the legislation. The three committees involved—the House Committee on Science, Space, and Technology, the Senate Committee on Commerce, Science, and Transportation, and the Senate Committee on Energy and Natural Resources—do not have jurisdiction over defense agencies. However, DOD was included in the new interagency coordination office and other coordination functions described in more detail below to help coordinate research between civilian and defense agencies and leverage investments by civilian agencies for national security applications.

The legislation creates a formal, structured initiative to more effectively advance QIS and associated technologies, requires a national strategic plan to accelerate the advancement and deployment of quantum technologies, and authorizes at least $1.3 billion over just the next five years to this effort. While authorization of funding is only guidance and is not binding on congressional appropriations, the authorized levels of funding in this legislation are consistent with appropriations for QIS across civilian federal research agencies over the last two fiscal years. The legislation supports, codifies, and in some cases accelerates what key research agencies were already doing or planning to do. For example, NSF already is investing in its Quantum Leap Big Idea, DOE already made $80 million in quantum science awards in fiscal year (FY) 2018, and OSTP already created a Subcommittee on QIS within the National Science and Technology Council (NSTC).

Key elements of the legislation include:

- **OSTP:** OSTP would be responsible for managing and coordinating research activities across the federal government for the NQI. The legislation establishes a National Quantum Coordination

Office at OSTP to help facilitate interagency coordination staffed by employees detailed from federal agencies such as NIST, NSF, DOD, DOE, and NASA. This Coordination Office would also support a new NSTC QIS Subcommittee responsible for coordinating QIS research, technology, and education activities and programs of the federal agencies; establish clear goals and priorities; identify any additional federal infrastructure needs to advance QIS; and evaluate opportunities for international cooperation with strategic allies. The Subcommittee would be jointly chaired by the Director of NIST, the Director of NSF, and the Secretary of Energy and include membership at a minimum from NSF, NASA, DOD, the Office of the Director of National Intelligence, and the White House Office of Management and Budget (OMB). The first task for the subcommittee is to develop a 5-year national strategic plan for QIS and deliver it to Congress by December 2019.

- **NQI Advisory Committee**: Congress would establish a new, external advisory committee that would provide advice to OSTP and the NSTC QIS Subcommittee. This advisory committee would consist of members from industry, academic institutions, and federal laboratories that would provide independent assessments on "trends and developments in QIS; progress made in implementing the Program; whether the Program activities, priorities, and technical goals developed by the Subcommittee are helping to maintain U.S. leadership in QIS and technology; the management, coordination, implementation, and activities of the Program; whether a need exists to revise the Program; whether there are opportunities for international cooperation with strategic allies on R&D; in QIS and technology; and whether national security, societal, economic, legal, and workforce concerns are adequately addressed by the Program." This advisory committee would be required to issue a report at least once every two years with its recommendations and the first repost is due in June 2019. OSTP will be managing the process of selecting and vetting candidates for this new advisory committee.
- **NSF** – The bill would direct NSF to implement an agency-wide QIS research and education program as well as multidisciplinary research and education centers. The former would include small-scale basic and interdisciplinary research and engineering efforts as well as a graduate traineeship program, while the latter would support up to five large-scale centers capable of supporting QIS research and workforce development through collaborations between academic, nonprofit, and industry partners. These centers would be based at a university or other nonprofit organization, and be funded at up to $10 million each annually between FY 2019 and FY 2023. The legislation would require each center to "work with other research institutions and industry partners to leverage expertise in quantum science, education and curriculum development, and technology transfer…promote active collaboration among researchers in multiple disciplines involved in quantum research including physics, engineering, mathematics, computer science, chemistry, and material science…support long-term and short- term workforce development in the quantum field…support an innovation ecosystem to work with industry to translate center research into applications; and…become self-sustaining after the expiration of NSF support."
- **DOE** – Under the bill, DOE would be directed to support a QIS research program to help meet the agency's scientific mission needs. The largest aspect of DOE's QIS program would be the establishment of up to five QIS research centers that would be based at National Laboratories but support partner institutions from academia and industry. The bill would authorize up to $25 million per center annually between FY 2019 and FY 2023 and each center could be renewed for another 5-year award period. DOE's program would also include basic research activities across

the Office of Science that advance specific QIS-related fields like quantum computing, sensing, networking, and materials, and that would be implemented in coordination with existing programs across DOE like the Nanoscale Science Research Centers and Energy Frontier Research Centers.

- **NIST** – NIST would be charged with convening "a consortium of stakeholders to identify the future measurement, standards, cybersecurity, and other appropriate needs for supporting the development of a robust quantum information science and technology industry in the United States." The bill would authorize $80 million annually between FY 2019 and FY 2023 to support this mandate. In September 2018, NIST launched a Quantum Economic Development Consortium (QEDC) and signed a cooperative research and development agreement with SRI International to lead the consortium. The consortium is primarily composed of representatives from private industry investing in quantum science and technology to improve public-private sector coordination, determine future workforce needs, and help define grand challenge questions for federal investments. The goal is for QEDC members to coordinate on precompetitive research and development such as quantum device design and prototyping and have access to quantum engineering capabilities at national labs and universities. NIST and SRI plan to hold a series of workshops to define the consortium's structure, governance, and major research and development areas.

Future Research and Funding Opportunities

***National Science Foundation***

*The Quantum Leap: Leading the Next Quantum Revolution* is one of NSF's 10 Big Ideas for Future Investment focused on breakthroughs that would accelerate innovation in quantum technologies such as quantum sensing, quantum communications, and quantum computing while also developing a highly-trained workforce. NSF has committed at least $30 million a year from FY 2018 through FY 2022 to fund multi-disciplinary, collaborative efforts in quantum science in addition to continuing individual Principal Investigator investments across NSF's programs. Some near-term opportunities include:

- Quantum Centers: NSF is in the planning stages of quantum center awards that would respond to the new NQI legislation and will likely address grand challenge questions in sub-field such as quantum communications, computing, simulation, sensing and metrology.
- Quantum Idea Incubator for Transformational Advances in Quantum Systems (QII-TAQS): A $26 million solicitation with an anticipated 18-20 awards to support interdisciplinary teams that will explore new concepts, platforms, or new approaches to accelerate the science, computing, and engineering of quantum technologies. Letters of intent are due January 7, 2019 and the solicitation is available at https://www.nsf.gov/pubs/2019/nsf19532/nsf19532.htm.
- NSF Quantum Computing and Information Science Faculty Fellows: NSF is committed to growing academic research capabilities in computing and information science to support advances in quantum computing and communication. This fellowship program seeks to support departments and schools in U.S. institutions of higher education that conduct research and teaching in computer science, information science, and computer engineering, with the specific goal of encouraging hiring of tenure-track and tenured faculty in quantum computing and

communication. The next preliminary proposal deadline is July 1, 2019. For more information, visit https://nsf.gov/funding/pgm_summ.jsp?pims_id=505535.

***Department of Energy***

DOE is becoming the largest federal funder of quantum computing and quantum information science. DOE, through the Office of Science, will continue to leverage its unique strengths, such as the DOE national laboratories and world-class user facilities, and serving as the largest federal government sponsor of the physical sciences, to advance QIS. The Office of Science plans to release additional targeted QIS funding opportunities in FY 2019 between January and March 2019. For FY 2019, the Office of Science has at least an additional $32 million available for single PI and small group awards above FY 2018 levels.

For FY 2020, in addition to continued investments in single PI and small group awards, DOE plans two large competitions:

- **DOE Quantum Centers:** Consistent with the NQI legislation, DOE plans to fund up to five centers each in the $15 million to $25 million scale a year over five-years with a possibility of renewal for another five-year term. The centers would be focused on grand challenge questions that would advance the basic understanding of quantum science and help advance applications like quantum computing, sensing, and communications, but not tied to any specific technology. The centers must be multi-disciplinary, bringing together disparate fields (e.g., physics, materials research, computer science, electrical engineering). The centers must also be multi-institutional bringing together universities, national labs, and private industry. Most of these centers will likely be led by national labs, but there are opportunities for university leads.
- **Energy Frontier Research Centers (EFRC):** The FY 2020 EFRC competition will include QIS as one research priority among others, such as energy storage and the energy-water nexus. The current quantum related centers are mostly focused on quantum materials and BES would like to explore other QIS research topics.

***Department of Defense***

The DOD Undersecretary for Research and Engineering, Dr. Mike Griffin, has not indicated that there will be any new, large initiatives related to QIS, but will soon lay out the Department's science and technology priorities for QIS pending the appointment of an assistant director for quantum science. This is consistent with the FY 2019 National Defense Authorization Act, which authorized the Secretary of Defense to establish a defense quantum information science and technology research and development program to coordinate all DOD activities and accelerate the transition and deployment of technologies. Some specific opportunities in FY 2019 include:

- the Air Force Research Lab plans to compete a Quantum Science Center of Excellence in 2019,
- the Defense Advanced Research Projects Agency plans to establish a new quantum science program,
- increased investments in QIS through existing programs such as the Multidisciplinary University Research Initiative and Vannevar Bush Fellowships, and

- additional single principle investigators in fundamental QIS through each DOD Service's basic research office from an additional $5 million in FY 2019 congressional authorization and appropriations.

*Sources and Additional Information:*

- The text of the National Quantum Initiative Act is available at https://www.congress.gov/115/bills/hr6227/BILLS-115hr6227eas.pdf.
- The White House's National Strategic Overview for Quantum Information Science is available at https://www.whitehouse.gov/wp-content/uploads/2018/09/National-Strategic-Overview-for-Quantum-Information-Science.pdf.

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**Department of Education Releases Whitepapers on Higher Education and Accreditation**

The U.S. Department of Education (ED) released two white papers last month, one on "rethinking higher education" and another on accreditation reform. "Rethinking" education has been a motif of Secretary of Education Betsy DeVos and the current Administration. In speaking to a group of higher education figures, Secretary DeVos noted, "So by 'rethink,' I mean this: everyone question everything to ensure nothing limits students from being prepared for what comes next." These white papers provide insights into efforts ED will undertake in the next two years of this Administration. Their influence is already being seen in the proposed regulatory revisions ED provided for the negotiated rulemaking sessions that begin this month. While ED is limited by what can be accomplished outside of a reauthorization of the *Higher Education Act* (HEA), these policy proposals could have important impacts on institutions in several areas including accreditation, financial aid, and regulatory oversight and compliance.

***Rethinking Higher Education Whitepaper***

The whitepaper frames rising costs, debates over the purposes of higher education, and "lack of philosophical diversity" as threats. It also addresses issues of access, completion, and the disparity in completion rates that non-traditional, low-income, and minority students have when compared to their peers. At its core, the whitepaper claims that the U.S. has "a higher education model that is fundamentally unchanged." This model is equated with being out of sync with real world experience and workplace demands. The paper also points to credential creep and relationships between accreditors and licensing boards as limiting pathways into professions. Another major issue identified is the $1.5 trillion in outstanding student loan debt and associated federal regulations meant to hold institutions accountable for federal resources.

The proposals in the whitepaper center on "empowering students," empowering institutions," and "empowering innovators." For students, this means providing opportunities for lifelong learning, addressing "needless credential inflation," supporting due process protections, and "emphasizing personal responsibility" when it comes to borrowing. Principles for institutions include regulatory relief, accountability measures that account for mission and students served, enabling institutions to limit student borrowing, "fair treatment" of religious institutions, among other proposals. In addressing

"innovators," proposals put forth include increasing additional Experimental Sites, "fair treatment" of distance education, promoting competency-based education and work-based learning models, expanding student aid to short-term programs (including for lifelong learners), better integrating non-accredited providers, among other proposals.

***Accreditation Reform Whitepaper***

In noting that ED is prohibited from intervening in curricular decisions, the whitepaper acknowledges the important role accreditors play in the regulatory "triad" that governs higher education in the U.S. It charges, however, that "accreditors and the institutions they oversee have too often been forced into a state of regulation induced conformity." ED believes this has led to stifled innovation and notes the Department's intention to revisit accreditation regulations. The whitepaper lists several proposals to develop "more effective and less costly regulatory requirements." These include allowing for more flexibility in determining if an accreditor is in compliance with standards for recognition, clearly defining the roles of accreditors; states; and ED in oversight, supporting greater flexibility for innovative practices, respecting the religious missions of private institutions, and ensuring the protection of free speech. Other proposals include considering institutional outcomes while accounting for an institution's student body and mission, redefining what constitutes a "substantive change" to encourage innovation, streamlining and clarifying ED's accreditor recognition process, and consider sanctions that would tier loss of Title IV funds.

***Future Considerations***

As ED continues to revise and promulgate regulations, and Congress continues efforts to reauthorize HEA, institutions and organizations should consider opportunities to advance priorities. The proposals mentioned above, increased Experimental Sites, a focus on work-based learning, support for innovative efforts, and interest in life-long learning can be leveraged while being sensitive to political realities and limitations. Institutions and organizations should take advantage of opportunities to submit comments, respond to policy requests, meet with officials, and provide policy proposals that align with mission and interests.

*Sources and Additional Information:*

- The *Rethinking Higher Education* whitepaper is available at https://www.insidehighered.com/sites/default/server_files/media/White%20Paper%20on%20Rethinking%20Higher%20Education%2012.19.18.pdf.
- The *Accreditation Reform* whitepaper is available at https://www.insidehighered.com/sites/default/server_files/media/White%20Paper%20on%20Accreditation%20Reform%2012.19.18.pdf.

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## Agency Updates and Funding Opportunities

### Advanced Research Projects Agency – Energy Releases Funding Opportunity for Nuclear Energy, Geothermal, and Ultra-Durable Concrete Early-Stage Technologies

On December 20, the U.S. Department of Energy's (DOE) Advanced Research Projects Agency – Energy (ARPA-E) released an $18 million funding opportunity announcement focused on innovative technologies supporting next-generation nuclear energy, high-temperature sensors for downhole geothermal exploration, and ultra-durable, lower-energy concrete for infrastructure. Over the next year, ARPA-E plans to release more of these smaller-scale, targeted opportunities that may inform larger ARPA-E investments or complement the current portfolio of ARPA-E programs.

The DOE table below summarizes important information related to each topic area, including award amount for each topic and the anticipated number of awards:

| Targeted Topic Title | Issue Date | Deadline for Questions to ARPA-E CO | Full Application Submission Deadline | Total Amount to be Awarded (subject to the availability of funds) | Anticipated Awards | Max Period of Performance | Expected date for Notifications |
|---|---|---|---|---|---|---|---|
| EXTREMELY DURABLE CONCRETES AND CEMENTITIOUS MATERIALS | 12/20/2018 | 5 PM ET, 2/8/2019 | 9:30 AM ET, 2/18/2019 | Approximately $8M total | 5-8 awards | 24 months | May 2019 |
| LEVERAGING INNOVATIONS SUPPORTING NUCLEAR ENERGY | 12/20/2018 | 5 PM ET, 2/8/2019 | 9:30 AM ET, 2/18/2019 | Approximately $8M total | 3-5 awards | 24 months | May 2019 |
| DOWNHOLE TOOLS TO ENABLE ENHANCED GEOTHERMAL SYSTEMS | 12/20/2018 | 5 PM ET, 2/8/2019 | 9:30 AM ET, 2/18/2019 | Approximately $2M total | 2-4 awards | 24 months | May 2019 |

***Extremely Durable Concretes and Cementitious Materials***

The objective of this research topic is to develop material and process improvements that would "(1) significantly (e.g., 2X or more) improve the durability of concrete and cementitious materials, while (2) maintaining or lowering the energy and emissions related to production and deployment of the material, and (3) remaining cost competitive with traditional materials when accounting for the intended service life and maintenance cycle." Previous DOE and ARPA-E projects were focused on reducing the energy intensity of cement and concrete *production*, but ARPA-E would like to explore ways to extending the *service life/use stage* of the material's lifecycle.

The research categories include:

- materials and mixtures (e.g., molecular design of more durable cementitious materials),
- advanced processing (e.g., novel pathways toward low-temperature processing of highly-durable materials), and
- modeling, testing, sensing, and maintenance (e.g., accelerated durability testing for concretes and cementitious materials).

ARPA-E is very explicit that it is not seeking proposals that provide only incremental improvements to current cement and concrete materials (including geopolymers and additive) or concrete construction techniques (including marginal advances in pour-in-place and pre-casting techniques). New

technologies and approaches must be suitable for use throughout the entire United States rather than one particular region and primary applications should be for nuclear facilities or general infrastructure, such as commercial and residential buildings.

***Leveraging Innovations Supporting Nuclear Energy***

The specific technical areas of interest under this research category include:

- "sensors, data analytics, robotics, and advanced controls (including autonomy and integration of machine learning) that limit or eliminate the need for humans to conduct regular monitoring and maintenance and enable early corrective action for abnormal conditions,"
- "high-performance moderators for gas-cooled reactors to enable increased power density,"
- "advanced power conversion systems for ultra-high temperature (>1500 °C) reactors,"
- "flexible power production" using technologies that allow "physically changing plant power output via sophisticated controls systems or management of reactor feedback behavior, or systems that enable variable output like storing heat for later use," and
- "advanced construction techniques for faster, lower-cost construction."

Researchers applying under this category should be familiar with the projects ARPA-E is currently funding under the Modeling-Enhanced Innovations Trailblazing Nuclear Energy Reinvigoration (MEITNER) program. ARPA-E is using this funding call to address additional technology gaps not currently funded under the MEITNER portfolio.

ARPA-E is explicit that it will not fund technologies for light water reactors, including Generation III or III+ designs, reactors that require fuel enriched above 20 percent, and heat exchangers.

***Downhole Tools to Enable Enhanced Geothermal Systems***

The focus is on novel low-cost sensor technologies that can mitigate risks and lower costs of enhanced geothermal development. The goal is to better characterize rock formations and fluid enthalpy at depth to facilitate reservoir creation and maintenance, reduce unexpected reservoir behavior, and lower costs associated with geothermal applications. ARPA-E also expects that technologies developed for this purpose may also offer side benefits in applications including oil and gas, subsurface energy/CO2 storage, aerospace and automotive engineering, nuclear energy, and space exploration.

Technologies of interest include but are not limited to:

- "Fiber-optic based sensors, such as distributed acoustic sensing (DAS), distributed temperature sensing (DTS), and distributed strain sensing (DSS)" and
- "Sensors that measure geofluid enthalpy; in particular, devices that measure real-time flowrate, temperature, steam fraction and pressure."

**Eligibility:** This opportunity is open to universities, DOE National Laboratories, individuals, and industry.

**Cost-share:** No cost share is required if a university or nonprofit applies as a standalone applicant. No cost share is required if a project team is composed exclusively of domestic educational institutions,

domestic nonprofits, DOE Labs, and/or Federal agencies. No cost sharing is required on any project of $300,000 or less.

**Award Size:** Award sizes may range from $100,000 to $3.6 million.

**Due Dates:** Full applications are due at **9:30 a.m. ET** on **February 18, 2019.** Questions are due at **5:00 p.m. ET** on **February 8, 2019.**

*Sources and Additional Information*:

- The full funding opportunity can be found at https://arpa-e-foa.energy.gov/ under DE-FOA-0001953.
- A program description and full list of current MEITNER projects can be found at https://arpa-e.energy.gov/?q=arpa-e-programs/meitner.

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**Department of Energy Announces $3.6 Million for Research on Watersheds**

The Department of Energy (DOE) recently announced $3.6 million for a watershed systems research program, which is part of a larger water security grand challenge initiative. This new research effort will be funded through the Biological and Environmental Research program within the Office of Science. DOE will fund awards for universities and non-profit organizations to explore the subsurface interactions of watershed systems and ultimately improve predictive modeling techniques for subsurface flows and biogeochemical interactions. This effort supports DOE's major research objective to "improve the understanding and representation of physical and hydro-biogeochemical processes that govern terrestrial surface and subsurface ecosystems, that in turn can be represented in system models to improve confidence in the models." For more detailed information on DOE's research priorities for this new research effort and guidance on topics for proposal submission, interested faculty and researchers should review the June 2017 workshop report on "Research Priorities to Incorporate Terrestrial-Aquatic Interfaces in Earth System Models."

University applicants are encouraged to partner with National Laboratories. In particular, there are already six national labs engaged in this research—Argonne, Lawrence Berkeley, Lawrence Livermore, Oak Ridge, Pacific Northwest, and SLAC. Individual awards will average $200,000 per year with a program period of three years. Applications will be accepted through the FY 2019 Continuation of Solicitation for the Office of Science Financial Assistance Program, which remains open through the end of the fiscal year on September 30, 2019. While pre-applications are not required, they are encouraged.

This initiative builds upon ongoing research efforts at the agency focused on water issues, including the recent solicitation for the Energy-Water Desalination Hub and a planned prize competition for improved operations of thermoelectric power plants.

*Sources and Additional Information:*

- The full solicitation is available at https://science.energy.gov/~/media/grants/pdf/foas/2019/SC_FOA_0001968.pdf.
- The press release announcing the award is available at https://science.energy.gov/news/featured-articles/2019/01-10-19-2/.
- The June 2017 workshop report on "Research Priorities to Incorporate Terrestrial-Aquatic Interfaces in Earth System Models" is available at https://science.energy.gov/~/media/ber/pdf/community-resources/Terrestrial-Aquatic_Interfaces_report.pdf.

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**Department of Energy Office of Science Releases Early Career Researcher Solicitation**

The U.S. Department of Energy (DOE) Office of Science (SC) has released the fiscal year (FY) 2019 Funding Opportunity Announcement (FOA) and National Laboratory Announcement (NLA) for its Early Career Research program. The program supports talented university and National Laboratory researchers early in their careers with the long-term goal of nurturing a scientific workforce capable of meeting SC mission needs. The program is applicable across all six SC program offices, and the full FOA and NLA outline specific needs within each that proposers must address.

Eligible applicants include untenured Assistant or Associate Professors who are on the tenure track at a domestic institution and full-time, non-postdoctoral employees at a National Laboratory. Applicants must also have acquired their Ph.D. no more than 10 years prior to submitting a proposal.

The present competition represents a significant expansion of the program over previous years. For FY 2019, SC intends to allocate $49 million for the program—$19 million above the FY 2018 FOA—to support up to 65 researchers. This amount will be split between university-based and National Laboratory-based proposals. Individual award sizes will likely average $750,000 over five years.

**Due Dates:** Pre-applications are due **February 6, 2019** for both the FOA and the NLA.

*Sources and Additional Information:*

- The full FOA is available at https://science.energy.gov/~/media/grants/pdf/foas/2019/SC_FOA_0002019.pdf.
- The full NLA is available at https://science.energy.gov/~/media/grants/pdf/lab-announcements/2019/LAB_19-2019.pdf.

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**Defense Advanced Research Projects Agency Seeks to Replicate Insects' Neural Systems for AI Under µBRAIN Solicitation**

The Defense Advanced Research Projects Agency (DARPA) Defense Sciences Office (DSO) released an opportunity entitled Microscale Bio-mimetic Robust Artificial Intelligence Networks (µBRAIN) under the Artificial Intelligence Exploration (AIE) program. The AIE program seeks to quickly engage and contract with proposers to advance research pertaining to "third wave" AI theory and applications that address the limitations from previous innovations, such as rule-based and statistical learning-based AI technologies. The µBRAIN solicitation is seeking proposals to understand the sensory and nervous systems in small insects to determine how their efficiency in size, weight, and power consumption (SWaP) can be replicated in AI systems.

**Award Size:** Successful proposals will result in an award of up to $1,000,000 for a performance period of no more than 18 months.

**Due Dates:** Proposals should be submitted through DARPA's BAA website at https://baa.darpa.mil no later than **February 4, 2019 at 4:00 PM ET.**

*Sources and Additional Information:*

- More information is available at https://www.fbo.gov/spg/ODA/DARPA/CMO/DARPA-PA-18-02-03/listing.html.

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**Air Force Research Laboratory Issues Presolicitation for ADMIRE Program**

The Air Force Research Laboratory (AFRL) is soliciting research proposals for the Airman Decision Making and Interface REsearch (ADMIRE) Program, aimed at understanding and delivering persistent situational awareness and improved warfighter decision making in integrated and synchronized air operations. The ADMIRE program seeks to "provide basic, applied and advanced research, development and demonstration for the mission of the 711th Human Performance Wing, Human Effectiveness Directorate, Warfighter Interface Division (711HPW/RHC)." This announcement provides an opportunity for researchers to influence the final solicitation for the ADMIRE program, and dialogue between researchers and technical and contracting government representatives before the final solicitation is highly encouraged. The solicitation will be released through a series of task orders associated with each of five technical areas:

- Battlespace Acoustics
- Supervisory Control and Cognition
- Aerospace Physiology
- Battlespace Visualization
- Applied Neuroscience

The Air Force anticipates making multiple awards for the ADMIRE program. Total funding for the program is estimated at $135 million over six years. Awards are anticipated to be made on July 18, 2019. Responses are due on **February 19, 2019 at 3:00PM ET.**

*Sources and Additional Information:*

- The full presolicitation can be found at http://www.fbo.gov under solicitation number "FA8650-19-S-6003."

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**Army Science Board Soliciting Input on Battlefield Uses of AI**

The Army Science Board released a request for information (RFI) related to their study of "Battlefield Uses of Artificial Intelligence (AI)." While the Army has invested in AI research for over 50 years, recent advances in algorithms and computing power and the availability of large data sets have expanded the potential military applications of the technology. The study is intended to enhance the Army's understanding of how AI can be introduced into the battlefield and what technical or social challenges exist that could hinder the full realization of AI's potential. We encourage faculty to submit comments because this study will impact the future of the Army and DOD's AI research.

**Due Dates:** Comments are due on **January 28 by 4:00 PM ET.**

*Sources and Additional Information:*

- The full RFI can be found at http://www.fbo.gov under solicitation number "W15QKN19X04YX."

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