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TUFTS UPDATE – SEPTEMBER 11, 2019
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Introduction

This edition of the Tufts Washington Update for September includes policy and 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, for more information on updates and opportunities, or to add a new recipient to the distribution list.

Policy and Agency Updates

OMB and OSTP Release FY 2021 R&D Budget Priorities Aimed at “Second Bold Era in S&T”

The Trump Administration released its annual memorandum on priorities for research and development (R&D) for fiscal year (FY) 2021, offering a forecast for federal agencies’ science and technology (S&T) investments in forthcoming budget requests. The memo, issued on August 30 just prior to the Labor Day holiday weekend, is the first developed by White House Office of Science and Technology Policy (OSTP) Director Kelvin Droegemeier in coordination with the Office of Management and Budget (OMB). It identifies strategic investments needed to maintain America’s leadership in S&T. Referencing the massive investments in research, infrastructure, and education made by the U.S. government following World War II, the White House calls for a “Second Bold Era in S&T” in order to build a workforce of the future, make transformational leaps in science, and take on “previously intractable” grand challenges facing the nation.

The memo has historically been released in June or July to guide the development of federal agency budget requests for the next fiscal year. However, this year’s memo was released after agencies have already developed most of their FY 2021 budget proposals, leaving little time for the S&T community to influence agency priorities and budget requests. At this stage, the document gives a preview of the Administration’s priorities that will be reflected in the President’s FY 2021 budget request.

The memo includes the following R&D priority areas (**new areas of emphasis in bold**):

- American Security
 - American Military Capabilities
 - Critical Infrastructure Resilience
 - Semiconductors
 - **Critical Minerals**
- American Leadership in Industries of the Future
 - AI, Quantum Science, and Computing
 - Advanced Communications Networks and Autonomy
 - Advanced Manufacturing
- American Energy and Environmental Leadership
 - Energy
 - **Oceans**
 - **Earth System Predictability**
- American Health and Bioeconomic Innovation
 - Biomedicine
 - Veteran Health and Wellness
 - **Bioeconomy**
- American Space Exploration and Commercialization

Though these priorities build off the Administration’s FY 2020 R&D memo, this year’s memo includes information that will help the S&T community align its research with the Administration’s interests and goals. New areas of emphasis include exploring, mapping, and characterizing the oceans to better understand economic opportunities and changes to the ocean system; building resilient supply chains for critical minerals; modelling and understanding earth system predictability; and advancing biotechnology to support the American Bioeconomy. Notably, new foci on the oceans and earth systems signals a willingness by the Administration to engage on earth and environmental sciences

research as it relates to economic competitiveness and national security. This economic lens will be helpful in advancing broader climate and earth sciences research moving forward.

The memo also contains five Cross-Cutting Priorities (**new areas of emphasis in bold**):

- Build and Leverage a Diverse, Highly Skilled American Workforce
- **Create and Support Research Environments that Reflect American Values**
- **Support Transformative Research of High Risk and Potentially High Reward**
- **Leverage the Power of Data**
- Build, Strengthen, and Expand Strategic Multisector Partnerships

Modernizing R&D infrastructure and supporting technology transfer, priorities for OSTP and OMB in the FY 2020 memo, were slightly de-emphasized but were noted as end goals of building strategic multisector partnerships. New cross-cutting priorities include supporting high-risk, high reward research; leveraging the power of data; and creating and supporting research environments that reflect American values. This last priority includes a wide variety of topics such as reducing administrative burdens for researchers, creating safe and inclusive research environments, and protecting American research assets. The memo's emphasis on the research environment responds to recent concerns over foreign influence in the nation's S&T enterprise and the issue of sexual harassment in science, two issues currently impacting the federally funded research ecosystem.

Sources and Additional information:

- The full OMB/OSTP R&D memorandum is available at <https://www.whitehouse.gov/wp-content/uploads/2019/08/FY-21-RD-Budget-Priorities.pdf>.

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President Trump Establishes National Quantum Initiative Advisory Committee

On Friday, August 30, President Trump signed an executive order creating the National Quantum Initiative Advisory Committee (NQIAC). This advisory body is required under the *National Quantum Initiative Act*, which was enacted in December 2018 and formally establishes a structured, multi-agency effort—known as the *National Quantum Initiative* (NQI)—to more effectively advance quantum information science (QIS) and associated technologies. The legislation also authorizes at least \$1.3 million over the next five years to support NQI and requires an accompanying national strategic plan.

The NQIAC will be administered by the Department of Energy (DOE), which is becoming the largest federal supporter of QIS research and development. The NQIAC, which will meet twice per year, will be charged with: guiding the implementation of the NQI; advising the QIS Subcommittee of the National Science and Technology Council; assessing trends within the broader QIS research landscape; and identifying potential opportunities for international collaboration in QIS research with strategic allies. Per the legislation, the NQIAC will also be required to submit a report containing its findings and recommendations once every two years. Membership will consist of the Director of the White House Office of Science and Technology Policy (or a designee), as well as 22 experts representing industry, academia, federal laboratories, and other agencies of the Federal Government. Each member will be appointed by the Secretary of Energy. The Department of Energy (DOE) recently issued its formal call for nominations to the NQIAC. University-based nominees should be both leading experts in the field of

quantum information science and, if possible, hold high-level positions within their institutions. A complete nomination package should include:

1. A nomination letter detailing the nominee's qualifications and field of expertise;
2. A biographical sketch of the nominee and a copy of their CV; and
3. The nominee's name and contact information.

Those appointed to the NQIAC will serve for two-year terms with the possibility of renewal. Nominations are due by **October 4, 2019**, and should be sent to NQIAC@science.doe.gov.

Sources and Additional Information:

- The executive order establishing the NQIAC is available at <https://www.whitehouse.gov/presidential-actions/executive-order-establishing-national-quantum-initiative-advisory-committee/>.
- The text of the *National Quantum Initiative Act* is available at <https://www.congress.gov/115/bills/hr6227/BILLS-115hr6227eas.pdf>.
- Additional information is available in the full solicitation, which can be found at <https://www.govinfo.gov/content/pkg/FR-2019-09-11/html/2019-19640.htm>.

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NSF Announces “Reintegrating Biology” Initiative; Town Hall Discussions Set for September

On August 13, the National Science Foundation's (NSF) Directorate for Biological Sciences (BIO) announced a new effort in its aim to facilitate a “unification of biology.” BIO is concerned that the biological sciences community is too fragmented and focused on the “deep study of narrowly defined problems.” This new activity by BIO aims to facilitate the formation of new integrated research teams that can span the scales of biological organization.

The “Reintegrating Biology” initiative, administered by the University Corporation for Atmospheric Research (UCAR), aims to address fragmentation in the BIO community by stimulating the “integration of diverse biological disciplines using innovative experimental, theoretical, and computational approaches” to investigate biological principles from the organism to biome scale. The initiative will start in September with a series of town hall discussions followed by “microlabs” and jumpstart meetings to solicit input regarding:

- “The exciting new research questions that could be addressed by combining approaches and perspectives from different subdisciplines of biology;
- the key challenges and scientific gaps that must be addressed to answer these questions; and
- the physical infrastructure and workforce training needed.”

The Town Halls will be hosted online on **September 17** from 11:00 AM to 12:30 PM (EST) and **September 18** from 1:00 PM to 2:30 PM (EST). These Town Halls are the first phase of the Reintegrating Biology initiative and will include presentations and breakout sessions on “different challenges, opportunities, and future trends.” The Town Halls are intended to generate community input to inform the next two phases of the initiative, “community development” and “3-Day Jumpstarts.” Town Halls will also be recorded and there will be an opportunity to submit input for those unable to participate.

According to the award abstract, the town hall discussions will be capped at 500 participants each. There will then be four virtual microlabs with 100 participants each that will further refine themes for future in-person and virtual jumpstart meetings.

This announcement builds off a previous BIO Dear Colleague Letter (DCL) released in December 2018 requesting input from stakeholders that could facilitate transformative, cross-cutting research in the biological sciences. The objective of the DCL was to use stakeholder responses to develop research topics/questions for new BIO “integration institutes,” collaborative research centers that would work to train the next generation of biological scientists through highly interdisciplinary research partnerships. NSF has not provided additional detail on when a solicitation for integration institutes will be released.

Sources and Additional Information:

- To register for a Town Hall session or for more information, please visit: <https://reintegratingbiology.org/town-halls/>.
- The December 2018 DCL on the integration institutes is available at <https://www.nsf.gov/pubs/2019/nsf19027/nsf19027.jsp>.
- Additional information on the Reintegrating Biology initiative is available at https://www.nsf.gov/awardsearch/showAward?AWD_ID=1940791&HistoricalAwards=false.

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NSF Reveals More Plans for SBE Reorganization

The National Science Foundation’s (NSF) Social, Behavioral, and Economic Sciences Directorate (SBE) recently announced two new programs—“[Security and Preparedness](#)” and “[Accountable Institutions and Behavior](#)”—as part of SBE’s ongoing reorganization. As Lewis-Burke [previously reported](#), SBE has been reorganizing several programs and launching new initiatives aimed at improving external support for the social and behavioral sciences portfolio.

These new initiatives, along with the existing “[Law and Social Sciences](#)” program, will cover research topics that had previously been included in the longstanding “Political Science” program at SBE. While laying out plans for SBE’s reorganization earlier this summer, Assistant Director Arthur “Skip” Lupia had proposed dividing the political science portfolio into two separate initiatives with planned research themes that align with the newly announced programs. The Political Science program no longer appears on the SBE website, but the Political Science Doctoral Dissertation Research Improvement Grants (PS DDRIG) are still listed.

The Security and Preparedness (SAP) program consolidates several funding sources from across the Directorate focused on global and national security issues, including research pertaining to “international relations, global and national security, human security, political violence, state stability, conflict processes, regime transition, international and comparative political economy, and peace science.” The Accountable Institutions and Behavior (AIB) program addresses “issues broadly related to attitudes, behavior, and institutions connected to public policy and the provision of public services,” including “the study of individual and group decision-making, political institutions (appointed or elected), attitude and preference formation and expression, electoral processes and voting, public administration, and public policy.” Proposals to both programs are due January 15, 2020.

Additional changes to existing programs will be announced throughout September as part of Dr. Lupia's reorganization of the Directorate. Additionally, we expect SBE will issue a Dear Colleague Letter (DCL) in the coming weeks to outline these changes and the potential creation of new programs to support social and behavior science research in areas such as infrastructure, human networks, AI and data science, ethics in research, and other emerging SBE priorities.

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Funding Opportunities

NSF Announces a New Long-Term Ecological Research Urban Site

On August 8, the National Science Foundation (NSF) released a funding opportunity announcement (FOA) for the Long-Term Ecological Research (LTER) Program, one of the only existing federal programs that emphasizes ecological monitoring and observations over extended periods of time, exploring research questions that short-term experiments are ill-equipped to answer. This solicitation looks to expand the breadth and interdisciplinary nature of the program by focusing on urban settings, integrating social, economic, and cultural processes to better understand how human populations interact with their environment. Proposals may include sites for which long-term data already exists or those that may require an entirely new effort. Potential focus areas under this solicitation include:

- “Interactions between human and natural systems, including land use and land cover change, and the role of demographic trends as drivers of social-ecological dynamics.
- The feedbacks between human attitudes, beliefs and values, and environmental patterns and processes.
- The role of institutions, governance structures, and socio-political forces in determining how human interactions and ecological processes feedback on each other.
- Integration of engineering and design with natural and social sciences.”

Consistent with previous awards made under this program, successful proposals will collect data across five focus areas: primary production; population dynamics and trophic structure; organic matter accumulation; inorganic inputs and movements of nutrients through the ecosystem; and patterns and frequency of disturbances. Though not required, awardees are encouraged to collaborate with existing LTER sites and leverage existing state and federal facilities.

Back in 1997, NSF established two urban LTER sites in Phoenix, Arizona and Baltimore, Maryland. NSF has been discussing the federal need for additional urban LTER sites for some time. In 2018 the NSF Advisory Committee for Environmental Research and Education (AC-ERE) released a report "Sustainable Urban Systems: Articulating a Long-Term Convergence Research Agenda" that recommended the creation of long-term projects focused on the urban environment. Beyond NSF, in 2015 the Biological and Environmental Research Advisory Committee (BERAC) within the Department of Energy's (DOE) Office of Science advised DOE that an urban focus should be the top priority for any new Integrated Field Laboratories (IFL). DOE did not extend the IFL model to include an urban site. The BERAC report is linked below.

Deadlines: The submission deadline for required preliminary proposals is **December 4, 2019**. The deadline for full proposals is **June 15, 2020**.

Award Information: NSF anticipates distributing \$7.1 million for one award under this opportunity, providing \$1.1 million annually over six years.

Eligibility: Eligible applicants under this opportunity include institutes of higher education. There is no limit on the number of proposals per individual PI or organization.

Sources and Additional Information:

- The full funding opportunity is available at https://www.nsf.gov/pubs/2019/nsf19594/nsf19594.htm?WT.mc_id=USNSF_25&WT.mc_ev=click.
- More information about the LTER program is available at https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=7671.
- The full BERAC Report is available at https://science.osti.gov/-/media/ber/berac/pdf/Reports/BERAC_IFL_Response.pdf?la=en&hash=1C5FDD44CE078F687F47059C0CCEA21ACAFF2261.
- The full NSF ERE AC report is available at <https://www.nsf.gov/ere/ereweb/ac-ere/sustainable-urban-systems.pdf>.

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DARPA Releases Young Faculty Award

The Defense Advanced Research Projects Agency (DARPA) Defense Sciences Office (DSO) recently released its research announcement (RA) for the Young Faculty Award (YFA). The YFA program aims to expose elite researchers in junior faculty or equivalent positions at academic and non-profit research institutions to the Department of Defense's (DOD) mission, challenges, and needs. The YFA RA reflects DARPA's long-term goal of developing the next generation of scientists and engineers in the research community who will focus their future careers on DOD and national security issues.

The RA includes 27 topic areas from across DARPA's six technology offices: Biological Technologies Office (BTO), Defense Sciences Office (DSO), Information Innovation Office (I2O), Microsystems Technology Office (MTO), Strategic Technology Office (STO), and Tactical Technology Office (TTO). DARPA specifically seeks revolutionary and innovative advances in science, devices, and systems and is not interested in incremental improvements to the current state-of-the-art. The topic areas include:

1. Unlocking the Secrets of Roman Concrete
2. In Vivo Biosensors
3. Decision Making Algorithm for Medical Countermeasure (MCM) Development
4. Microbial Community Modeling
5. Biological Systems for Sensing, Reporting, and Mitigating Air Contamination
6. Distributed Intelligence in Flexible Robots
7. Bioinspired Soft-Matter Electrical Circuits
8. Room-temperature Chip-scale Quantum Opto-mechanical Sensors
9. AI System Engineering
10. Advanced Corrosion Control
11. Economics-driven Secure Multiparty Computation
12. Cross-Cultural Extrapolation of Privacy-Oriented Human-Technology Interactions
13. Scientific Model Aware Computing
14. Push Science
15. Visualization Innovations for Cyber Terrain Operations Representation (VICTOR)
16. Reducing Errors in Quantum Systems
17. Dielectrics for High-Temperature CMOS FETs

18. A Physics-Based Re-exploration of Spectrum Allocation
19. Detecting Cognitive Dissonance & Belief Shift Over Time
20. Chip-scale Blind Sampled Wideband Periodogram and Time Transfer by Machine Learning
21. Practical Antineutrino Detectors
22. RF Power Harvesting for Remote Sensing
23. Low Loop Latency Distributed Time Transfer
24. High-Entropy Alloys Study
25. Ocean Object Identification via Distributed Sensors
26. Flame Stability and Ignition in Partially-Premixed High-Speed Flows
27. On-Orbit Servicing Architectures for Proliferated Low Earth Orbit (LEO) Constellations

DARPA will not review proposals that do not address a specific topic area. More information on each topic is available in the full RA. Proposers are encouraged, but not required, to submit an executive summary in order to solicit feedback and determine interest from DARPA program managers. Investigators may submit one executive summary per topic area, but should not address more than one topic per executive summary. Investigators may only submit one full proposal under one topic area.

DARPA strongly encourages proposers to familiarize themselves with DARPA's mission and current programs. Additionally, proposers should understand and apply the Heilmeier Questions to their research, which program managers use to consider and evaluate research proposals.

Awards: DARPA anticipates funding multiple awards, but does not specify how many. Individual awards will include a maximum of \$500,000 for a 24-month base period, with an option to extend funding for up to \$500,000 over a 12-month period.

Eligibility: DARPA will accept proposals from any "current tenure-track Assistant or Associate Professors and tenured Assistant or Associate Professors within three (3) years of their tenure appointment" at a U.S. institution of higher education, non-profit, science or technology research institution. Previous YFA recipients are not eligible to apply.

Submission Deadlines: Executive summaries should be submitted through DARPA's submission website at <https://baa.darpa.mil> no later than **September 18, 2019 by 4:00 PM ET**. Full proposals are due by **November 19, 2019 by 4:00 PM ET**.

Additional Sources and Information:

- The full solicitation can be found at www.grants.gov under solicitation number "DARPA-RA-19-01."
- Additional information on the YFA, including a link to previous awards, can be found at <https://www.darpa.mil/work-with-us/for-universities/young-faculty-award>.
- More information on DARPA can be found at <https://www.darpa.mil/about-us/about-darpa>.
- The "Heilmeier Catechism" can be found at <https://www.darpa.mil/work-with-us/heilmeier-catechism>.

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DARPA I2O Announces Semantic Forensics BAA for Disinformation Attacks

The Defense Advanced Research Projects Agency (DARPA) Information Innovation Office (I2O) has released a broad agency announcement (BAA) through its Semantic Forensics (SemaFor) program seeking innovative approaches to develop semantic technologies that defend against large-scale, automated disinformation attacks. Proposals should aim to enable “revolutionary advances” in science, devices, or systems to detect falsified and manipulated media through semantic inconsistency detectors. Specifically, technologies developed through SemaFor should be able to “detect, attribute, and characterize falsified multi-modal media.” DARPA I2O seeks proposals that utilize more than statistical detection methods and single media modality. Academia, businesses, and other organizations are eligible to apply.

Submission Deadlines: Full proposals are due on **November 21, 2019** at **12:00pm ET**.

Additional Sources and Information:

- The full BAA can be found at www.grants.gov under solicitation number “HR001119S0085.”

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ONR Releases Solicitation for Atomic and Quantum Science and Technology

The Office of Naval Research (ONR) has released a Special Notice announcing a new research thrust entitled “Atomic and Quantum Science and Technology” under its fiscal year (FY) 2019 Long-Range Broad Agency Announcement (BAA). Specifically, ONR is seeking white papers and proposals for basic and applied research that “will lead to future generations of clocks, inertial sensors, materials, and communications and networking devices supporting current and future Navy and Marine Corps requirements.” Specific topics are outlined in the Special Notice, which also stipulates that resulting research activities will address Technology Readiness Levels 1-4.

It is important to note that this is not a formal solicitation. Rather, ONR intends this Special Notice as a means to provide direction for the quantum research community and establish a framework for white paper and proposal submissions. White papers are not required but they are strongly encouraged since ONR will use them to gauge the value of the proposal to its mission needs. Please be advised that the white paper submission deadline is **September 20, 2019**, and that full proposals are due by **November 15, 2019**.

Sources and Additional Information:

- The Special Notice can be found at <https://www.onr.navy.mil/en/work-with-us/funding-opportunities/special-notices>.
- The ONR Long-Range BAA can be found at <https://www.onr.navy.mil/en/work-with-us/funding-opportunities/announcements>.

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IARPA Releases RFI on Energy Storage Systems

The Intelligence Advanced Research Projects Activity (IARPA) released a request for information (RFI) on electrical energy storage systems and components. The RFI is seeking information on technologies related to portable electronic devices and high-power electric vehicles in two specific research categories: 1) high energy storage systems and 2) thermally resilient energy storage systems. The RFI is an opportunity for researchers to influence the technical research efforts of IARPA. Responses to the RFI are due on **September 23, 2019** no later than **5:00 PM ET**.

Additional Sources and Information:

- The full RFI can be found at www.fbo.gov under solicitation number "IARPA-RFI-19-09."

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