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TUFTS UPDATE – APRIL 23, 2019
PREPARED BY LEWIS-BURKE ASSOCIATES LLC

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Introduction

This edition of the Tufts Washington Update for late April includes 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.

Agency Updates and Funding Opportunities

Department of Energy Solicits Proposals for AI Research, Research Time at Leadership Computing Facilities

The Office of Advanced Scientific Computing Research (ASCR) within the Office of Science of the U.S. Department of Energy (DOE) has issued two solicitations totaling $13 million for proposals to advance artificial intelligence (AI) and machine learning (ML). The release of these opportunities represents DOE's commitment to fulfilling a mandate included in the fiscal year (FY) 2019 Energy and Water Development Appropriations bill that allocated $13 million to support research on AI and big data to help meet the agency's scientific needs. While these activities are confined to ASCR in FY 2019, they will lay the groundwork for an expanded AI initiative that will cut across multiple Office of Science programs in FY 2020. Related efforts are also planned for the National Nuclear Security Administration.

ASCR is also soliciting proposals from the external community for usage of the Argonne and Oak Ridge Leadership Computing Facilities (ALCF and OLCF). The program, entitled *Innovative and Novel Computational Impact on Theory and Experiment (INCITE)*, is open to external applicants seeking to leverage the capabilities of the ALCF and OLCF for research in a wide array of science and engineering domains.

Artificial Intelligence, Machine Learning, and Data Analytics Co-Design

As mentioned above, ASCR has announced its intention to provide $13 million to advance AI and ML capabilities through two separate funding opportunities. Out of the total, $11 million will be available exclusively to the National Laboratories through a National Laboratory Announcement (NLA) entitled *Artificial Intelligence, Machine Learning, and Data Analytics Co-Design*. Other entities are permitted to participate but must be listed on proposals as sub-awardees.

The NLA is specifically soliciting proposals for the co-design of learning systems and AI environments relevant to the agency's mission space. Emphasis will be placed on proposals that would support the development of AI and ML methods capable of being integrated with emerging hardware. Factors such as power consumption, cost of data consumption, and resilience should also be considered. The NLA also specifically instructs proposers to include "co-design R&D activities where specific classes of AI systems and/or foundational AI system architecture and software are proposed." Solutions developed through these endeavors should address challenges unique to DOE's scientific, energy, national security, and/or day-to-day needs.

Award Amount and Performance Period: ASCR expects to provide $11 million for two or three awards ranging in size between $750,000 and $2 million annually for up to three years.

Eligibility: Only DOE National Laboratories may submit proposals as leads, though other entities, including universities, may participate as sub-awardees.

Submission Limitations: Each DOE National Laboratory is limited to submitting two proposals on which it is the lead.

Important Deadlines:
- Letters or Intent – **May 1, 2019**
- Full Proposals – **May 31, 2019**

Sources and Additional Information:

- The full NLA is available at https://science.energy.gov/~/media/grants/pdf/lab-announcements/2019/LAB_19-2119.pdf.

Scientific Machine Learning and Artificial Intelligence: Uncertainty Quantification

The remaining $2 million (out of the total of $13 million) will be reserved for research in "Uncertainty Quantification (UQ) for AI validation and prediction." Unlike the NLA, this Funding Opportunity Announcement (FOA) will be open to the broader external community, including universities.

Compared to the abovementioned NLA, this FOA is more focused on foundational research. ASCR is seeking to advance UQ methods to improve validation of ML- and AI-enabled predictions based on the data generated by Office of Science user facilities and simulations. To that end, interested proposers are encouraged to consider UQ as a broad set of integrated research topics that could include verification and validation, representation of uncertainty and error, sensitivity and uncertainty analysis, and multiscale modeling and simulation among many others. These thrusts originated in the report entitled *Basic Research Needs for Scientific Machine Learning: Core Technologies for Artificial Intelligence*, which itself is based on the findings of a workshop ASCR hosted in January 2018.

Award Amount and Performance Period: ASCR expects to provide $2 million for between two and six awards, each funded at $150,000 annually for up to two years.

Eligibility: All types of applicants are eligible to submit proposals in response to this FOA with the exception of Federally Funded Research and Development Center (FFRDC) contractors. DOE National Laboratories may apply for funding through a separate NLA. DOE will not fund multi-institutional collaborations under this FOA.

Submission Limitation: Individuals are limited to participating in up to two applications.

Important Deadlines:
- Letters of Intent – **May 8, 2019**
- Full Proposals – **May 31, 2019**

Sources and Additional Information:

- The full FOA is available at https://science.energy.gov/~/media/grants/pdf/foas/2019/SC_FOA_0002122.pdf.
- The Basic Research Needs report is available for download at https://www.osti.gov/biblio/1478744.

Innovative and Novel Computational Impact on Theory and Experiment (INCITE)

DOE is now accepting applications for time on the ALCF and OLCF through the *INCITE* program from the external community. The solicitation encourages proposals that seek to leverage these user facilities for transformational advances across a variety of science and engineering domains. *INCITE* also encourages projects that apply specifically to data science, ML, and "convergence of simulation, data and learning".

Performance Period: In total, DOE expects that up to 60 percent of the allocable time on the ALCF and OLCF will be available for use for awards lasting up to three years.

Eligibility: This solicitation is open to universities, industry, and other government agencies.

Important Deadlines:
- Proposal Writing Seminars – **May 9 and June 4, 2019**
- Full Proposals – **June 21, 2019**
- Award Announcements – **November 2019**

Sources and Additional Information:

- Additional information about *INCITE*, including proposal submission instructions and webinar details, is available at https://www.alcf.anl.gov/articles/us-department-energy-s-incite-program-seeks-proposals-2020.

- The full OWEP solicitation can be found at https://grants.hrsa.gov/2010/Web2External/Interface/FundingCycle/ExternalView.aspx?fCycleID=b46a08de-2bc2-421f-8b5e-71de9cc9b17d.

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Department of Energy Releases Two Opportunities for Technology Enhancements and Maturation

Funding Opportunity Announcement for the DIFFERENTIATE Program

On April 5, the Department of Energy's (DOE) Advanced Research Projects Agency – Energy (ARPA-E) released a $15 million funding opportunity announcement (FOA) for the Design Intelligence Fostering Formidable Energy Reduction and Enabling Numerous Totally Impactful Advanced Technology Enhancements (DIFFERENTIATE) Program to better integrate machine learning and artificial intelligence (AI) into the design of energy products and technologies. The primary objective of this opportunity is to accelerate the transition to "lower-carbon-footprint energy sources" by significantly increasing the speed and efficiency of the technology development processes through the integration of machine learning. This FOA encourages the formation of interdisciplinary research teams incorporating machine learning, mathematics, computing, and mechanical/chemical/materials/or electrical engineering to address one of the following three problem areas:

- "Hypothesis generation (i.e. Conceptual Design) tools;
- High-fidelity hypothesis evaluation (i.e. Detailed Design) tools; and
- Inverse design tools."

Research teams are expected to identify one of the challenge areas, propose a solution with an established approach, outline a data acquisition or creation strategy, identify potential development risks, offer a mitigation strategy to the identified risks, and outline an "anticipated path to commercial relevance (i.e. open source software and algorithms; commercial software; or proprietary algorithms, software and/or design processes) for the design tool/software to be developed." The full solicitation provides examples of potential solutions to each problem area and encourages applicants to leverage "rapidly advancing machine learning technology in the realization of the three targeted capabilities."

Deadlines: The submission deadline for concept papers under this solicitation is **May 20, 2019**. The deadline for full applications has not been set.

Award Information: ARPA-E anticipates making approximately $15 million available for seven awards. Individual award amounts range from $250,000 to $5 million for a program period of up to two years.

Cost Share: A 20 percent cost share is required for the primary recipient of the grant or cooperative agreement. For awards distributed under other transaction agreements (OTAs), the primary recipient must provide 50 percent of the total project cost. However, universities applying as standalone applicants or as part of a project team of exclusively domestic universities are not required to provide cost share.

Request for Information to Mature ARPA-E Funded Technologies

On April 8, ARPA-E released a new request for information (RFI) to frame a potential new funding opportunity to mature previously-funded technologies. The agency hopes to use this RFI to decrease the gap between ongoing or completed ARPA-E-funded projects and commercialization. This gap often allows foreign entities to buy the intellectual property and develop it themselves, harming national competitiveness.

ARPA-E is seeking information from three specific groups: "ARPA-E-supported technology developers, potential investors in companies developing ARPA-E-funded technologies, and industry stakeholders." With feedback from these groups, the RFI aims to:

- "Identify successful ARPA-E technologies that have established proof of concept and are ready for scaling R&D projects in manufacturability, reliability, etc.
- Identify the companies that propose to lead the next stage of development for these ARPA-E technologies.
- Gauge interest from potential investors and industry partners to support and participate in scale-up/pilot projects.
- Frame the structure and management for potential funding opportunities to support scale-up/pilot projects of ARPA-E technologies with investor and industry participation.

- Facilitate engagement between innovators and partners, specifically to make connections in advance of the ARPA-E Energy Innovation Summit in July 2019."

As this effort will be unlike other ARPA-E programs, the agency anticipates requiring a cost share of at least 50 percent. Other Transaction Authority (OTA) agreements will also be considered to allow awardees greater flexibility. In the potential funding opportunity, ARPA-E will likely ask for interdisciplinary teams and strong engagement with industry stakeholders with the goal of "substantial U.S. manufacturing of resulting technologies for use/sale worldwide."

Of note, ARPA-E will be hosting an [Energy Innovation Summit](#) in Colorado on **July 8-10**, and this RFI will be used to facilitate connections between stakeholders at the summit. Those interested in applying to this potential funding opportunity are encouraged to attend the summit to make connections with industry and ARPA-E program managers.

Due Date: Responses should be submitted to RFI@hq.doe.gov by **5:00 PM ET** on **May 29, 2019**.

Sources and Additional Information:

- A press release announcing the FOA is available at https://www.arpa-e.energy.gov/?q=news-item/department-energy-announces-20-million-develop-artificial-intelligence-and-machine.
- The full solicitation is available at http://www.lewis-burke.com/sites/default/files/differentiate_de-foa-0002107_final_1.pdf.
- The RFI can be found at https://arpa-e-foa.energy.gov/#FoaIdedfac257-7b02-4135-b9a9-faf83d8f0616.

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U.S. Agency for International Development Releases Feed the Future Innovation Lab for Crop Improvement Solicitation

The U.S. Agency for International Development (USAID) released a solicitation for a new Feed the Future Innovation Lab for Crop Improvement that would streamline and manage USAID investments across multiple units focused on crop innovation. USAID will award one cooperative agreement to a managerial entity that will "design, lead, and implement a program of crop improvement research and capacity building" consolidating ongoing research in millet, sorghum, and legumes, while expanding to three new crops: roots, tubers, and bananas.

This new Crop Improvement Innovation lab is an outgrowth of the USAID Office of Agriculture Research and Policy (ARP) strategic framework for crop innovation, which focuses on "development and scaling of improved crop varieties to function as drivers of productivity, growth, resilience, and nutrition." Ultimately, the new framework is intended to align USAID investments across multiple units, including existing Innovation Labs, and tie market demand to "upstream breeding systems." Therefore, applicants must meet specific criteria to develop and transfer tools and methods to improve efficiency and accuracy; strengthen capacity of country partners; coordinate among the global research community; and align research activities and outputs.

USAID Feed the Future Initiative launched in 2010 and currently supports 22 Innovation Labs across the country.

Award Funding: USAID anticipates an award ceiling of $35 million for a five-year Leader with Associates (LWA) cooperative agreement, with $25 million for the Leader awards and $10 million of potential additional non-competitively awarded funding for technical activities from other USAID missions.

Eligibility: See notice for full eligibility criteria.

Webinar: USAID will host an open webinar for the public to ask questions on **April 22, 2019 at 1pm ET**.

Deadline: Responses are due on **June 21, 2019**.

Sources and Additional Information:

- More info on the Feed the Future Innovation Labs is available at https://www.feedthefuture.gov/feed-the-future-innovation-labs/.
- The full solicitation is available at https://www.grants.gov/web/grants/search-grants.html?keywords=feed%20the%20future%20innovation.

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National Institute of Food and Agriculture Releases AFRI Sustainable Agricultural Systems Request for Applications

On March 29, the U.S. Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA) released a request for applications (RFA) for the Agriculture and Food Research Initiative (AFRI) Sustainable Agricultural Systems (SAS) program to address critical sustainability and agricultural issues of local, national, and global significance. Originally launched in FY 2018, the FY 2019 SAS solicitation will focus on leveraging advances made in data science, engineering, social sciences, nanotechnologies, advanced manufacturing and other disciplines to make novel discoveries in agriculture and generate new high-skill jobs.

The solicitation is for integrated projects only, which must include research, education, and extension components within a project. Applicants are encouraged to take a systems-based approach to solve pressing agricultural challenges by promoting research, education, and extension at the intersection of science, technology, and agriculture and are required to outline concrete efforts to enhance training and education. Additionally, extension activities should focus on public engagement to encourage acceptance of transformative discoveries. Successful applicants under this RFA will address one of the following issue areas:

- "Increasing profitability in agriculture through reducing input costs, increasing productivity, and reducing losses due to environmental and biological stresses, including pests and diseases;

- Fostering economic development and prosperity in rural America by catalyzing production of high-value bio-based chemicals and other products using agricultural feedstocks; and
- Enhancing rural prosperity and health by ensuring access to affordable, safe and nutritious food to sustain healthy lifestyles."

Because the SAS program is focused on long-term goals, proposals should include concrete metrics for success, which may include "how the proposed system and its components contribute to productivity and profitability, reduced environmental footprint, natural resources quality, food safety and quality, nutritional security, human health and well-being, a skilled workforce, and safe jobs."

Eligibility: Eligible entities include colleges and universities, please see RFA for complete eligibility requirements.

Deadlines: The submission deadline for Letters of Intent is **June 4, 2019**. The submission deadline for full proposals is **September 26, 2019.**

Total Funding and Award Size: USDA anticipates making $90 million available for this RFA. Individual award amounts may not exceed $10 million with a program period of up to five years.

Cost Share Requirement: If an Integrated Project is commodity-specific and not of national scope, matching funds from non-Federal sources with cash or in/kind contributions are required. NIFA may waive this requirement if the project meets criteria specified in the RFA.

Sources and Additional Information:

- The full SAS RFA can be found at https://nifa.usda.gov/sites/default/files/rfa/FY19-AFRI-SAS.pdf.
- FY 2019 USDA NIFA budget request explanatory notes can be found at https://www.obpa.usda.gov/19nifa2019notes.pdf.
- More AFRI RFA Resources can be found at https://nifa.usda.gov/resource/afri-request-applications-resources.

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