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PREPARED BY LEWIS-BURKE ASSOCIATES LLC

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Introduction

This edition of the Tufts Washington Update for early February includes Congressional updates, Funding Opportunities, administration updates, and agency updates. 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 Amanda Bruno, Lewis-Burke Associates LLC, at amanda@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.

Congressional Updates

President Trump Releases FY 2021 Budget Request

Linked below is an analysis prepared by Lewis-Burke Associates LLC outlining President Trump's proposed fiscal year (FY) 2021 budget request for federal research, education, and health programs. The budget request provides a window into Trump Administration priorities as well as activities and planning underway at federal agencies for the coming year. Many of the largest civilian research agencies, such as the National Institutes of Health, the National Science Foundation, and the Department of Energy Office of Science are once again threatened with reductions. Ultimately Congress will decide on funding levels for FY 2021, and the research, higher education, and healthcare communities will continue to advocate to protect and grow critical agencies and programs.

Sources and Additional Information:

- The Lewis-Burke Analysis of President Trump's FY 2021 budget request is available at https://www.lewis-burke.com/sites/default/files/budget_update_-_analysis_of_the_presidents_fiscal_year_fy_2021_budget_request_for_federal_research_health_and_education_programs_004.pdf.

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Lewis-Burke 2020 Congressional Outlook

Please find linked below Lewis-Burke's 2020 Congressional Outlook of major legislative action of interest to institutions of higher education, scientific societies and research organizations. While most attention in 2020 will be focused on impeachment, the Democratic Presidential primaries, and the upcoming November election, Congress is still poised to advance, and in some cases pass, final legislation that would benefit major research, higher education, and academic medicine programs. We included predictions on the likelihood of Congress passing major legislation this year followed by more detailed information on major pieces of legislation being considered by both the House and Senate.

Sources and Additional Information:

- Lewis-Burke's 2020 Congressional Outlook is available at https://www.lewis-burke.com/sites/default/files/lewis-burke_2020_congressional_outlook_final_0.pdf.

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House Space and Aeronautics Subcommittee Introduces and Considered NASA Authorization Bill

On January 29, the House Committee on Science, Space, and Technology's Subcommittee on Space and Aeronautics met to consider the *National Aeronautics and Space Administration Authorization Act of 2020* (H.R. 5666).

H.R. 5666 stands in stark contrast with both its bipartisan Senate companion (S. 2800) and NASA and White House priorities related to the Agency's human exploration agenda. Specifically, the House legislation eschews the Artemis program, which seeks to return humans to the Moon by 2024 and establish a long-term human presence on the lunar surface. The legislation would instead pivot NASA

towards a comprehensive "Moon to Mars" program that includes a mission to the lunar surface in 2028 followed by a Mars flyby mission in 2033.

Relevant to the research community, the bill includes perennial language directing that NASA adhere to decadal survey recommendations in guiding its research priorities and mission portfolio. It also expresses support for NASA's use of small satellites to augment its science activities and would authorize missions previously slated for termination by the Administration, such as PACE and CLARREO in the Earth Science Division and WFIRST within the Astrophysics Division.

H.R. 5666 includes less controversial provisions related to programs elsewhere at NASA. Within the Aeronautics Research Mission Directorate, the bill would authorize the continued implementation of the University Leadership Initiative (ULI) program. ULI supports universities or university-led teams conducting research to overcome specific technical challenges while contributing to the aeronautics workforce development pipeline. Unlike the Senate, the House's Space Technology Mission Directorate focuses on activities related to specific technology areas such as nuclear propulsion and optical communications.

The bill expresses support for the Office of STEM Engagement, which the Administration has sought to eliminate. It would also mandate an independent review of the Space Grant College and Fellowship program to assess its successes and adherence to existing statute. This comes as NASA undertakes an internal review of the program's alignment with the goals and priorities of other Mission Directorates.

Subcommittee members approved the measure via voice vote following the adoption of several amendments including one mandating an assessment of a proposed Space Resources Institute. The bill faces a significant uphill battle going forward. NASA Administrator Jim Bridenstine's public disapproval of the measure, and subsequent surprise attendance at the Subcommittee's mark-up, threatens to jeopardize the initial bipartisan support it received upon introduction. The legislation also elicited sharp criticism from industry stakeholders, many of which have to varying degrees invested in the Artemis program's architecture. Republican members of the Subcommittee struck a measured tone of continued support for the bill and vowed to work on improvements with the Majority ahead of full Committee consideration at a later date.

Lewis-Burke will continue monitoring H.R. 5666 as it moves through House consideration. In the meantime, please don't hesitate to reach out with any questions on specific items of interest or concerns.

Sources and Additional information:

- Additional information, including the bill text, is available at https://www.congress.gov/bill/116th-congress/house-bill/5666/text?q=%7B%22search%22%3A%5B%22H.R.+5666%22%5D%7D&r=1&s=1

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Funding Opportunities

Department of Energy Releases Solar Energy Funding Opportunity

The U.S. Department of Energy (DOE) recently released its $126 million funding opportunity announcement for solar technologies. DOE will fund the following topic areas:

- **Photovoltaics (PV) Hardware Research –** $15 million for 8-12 projects that aim to extend PV system lifetimes and reduce hardware costs of solar systems made of silicon solar cells, as well as new technologies like thin-film, tandem, and perovskite solar cells.
- **Integrated Thermal Energy Storage and Brayton Cycle Equipment Demonstration (Integrated TESTBED) –** $39 million for 1-2 projects that will develop a test site to accelerate the commercialization of supercritical carbon dioxide power cycles, a key component of low-cost concentrating solar power plants.
- **Solar Energy Evolution and Diffusion Studies 3 (SEEDS 3) –** $10 million for 6-8 projects that will examine how information flows to stakeholders to enable more efficient decision-making about solar and other emerging technologies, such as energy storage.
- **Innovations in Manufacturing: Hardware Incubator –** $14 million for 7-9 projects that will advance innovative product ideas from a prototype to a pre-commercial stage, with an aim for products that support a strong U.S. solar manufacturing sector and supply chain.
- **Systems Integration –** $30 million for 7-11 projects that will develop resilient community microgrids to maintain power during and restore power after man-made or natural disasters, improve cybersecurity for PV inverters and power systems, and develop advanced hybrid plants that operate collaboratively with other resources for improved reliability and resilience.
- **Solar and Agriculture: System Design, Value Frameworks, and Impacts Analysis –** $6.5 million for 4-6 projects that will advance the technologies, research, and practices necessary for farmers, ranchers, and other agricultural enterprises to co-locate solar and agriculture.
- **Artificial Intelligence Applications in Solar Energy with Emphasis on Machine Learning –** $6 million for 8-12 projects that encourage partnerships between experts in AI and solar industry stakeholders to develop disruptive solutions across the value chain of the solar industry.
- **Small Innovative Projects in Solar (SIPS): PV and Concentrated Solar Power (CSP) –** $5 million for 15-20 projects that advance innovative and novel ideas in PV and CSP that can produce significant results within the first year of performance.

Key dates include:

FOA Issue Date:	February 5, 2020
Submission Deadline for Mandatory Letter of Intent (LOI) for Topics 1-7:	March 9, 2020
Informational Webinars:	Webinar information will be available in EERE Exchange at https://eere-Exchange.energy.gov.
Submission Deadline for Concept Papers: • Topic Area 8 SIPS applicants DO NOT submit a Concept Paper.	March 16, 2020
Submission Deadline for Mandatory Letter of Intent (LOI) for Topic Area 8: Small Innovative Projects in Solar (SIPS)	April 9, 2020
Submission Deadline for Full Applications:	May 21, 2020
Submission Deadline for Topic Area 8 SIPS Applications:	May 21, 2020
Expected Submission Deadline for Replies to Reviewer Comments (Topic Areas 1-7 only):	July 1, 2020
Expected Date for EERE Selection Notifications:	Late September 2020
Expected Timeframe for Award Negotiations:	Late November 2020

Sources and Additional Information:

- The FOA is available at https://eere-exchange.energy.gov/ under FOA number "DE-FOA-0002243."

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Department of Transportation Exploratory Advanced Research Program Releases BAA

The U.S. Department of Transportation's (DOT) Exploratory Advanced Research Program (EAR) has made $4 million available for a Broad Agency Announcement (BAA) supporting fundamental transportation research. As previously reported by Lewis-Burke in January, the BAA will support cooperative agreements and contracts in three distinct research topics:

- Blockchain technology for highway transportation;
- Artificial intelligence for highway transportation;
- Compatibilization of waste plastic to enhance mechanical properties of asphalt cement.

Notably, the BAA is targeted at research focusing on transitioning technologies from Technology Readiness Level (TRL) 2 or 3 to TRL 5 or 6. Proposals should include a technology transition plan outlining the "anticipated stage of development of the technology at the completion of the proposed effort, describing how the research is anticipated to result in an increased understanding/expansion of the knowledge base for the topic, and the anticipated overall approach to advancing the technology further, either through further applied research, commercialization other mechanisms."

EAR has made available up to **$4 million** which will support between four and six awards. Proposals will be due by **2:00 PM EST on March 20, 2020.** EAR anticipates making final awards in September. Program staff are available for inquiries during an initial question period that will close on **February 18, 2020.**

Sources and Additional Information:

- The BAA can be found at https://beta.sam.gov/opp/75f5fea0e3ec47d08bc2ffb9d7b34c33/view.

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Naval Surface Warfare Center Announces BAA for Basic and Applied Research Proposals

The Naval Surface Warfare Center (NSWC) Crane Division released a broad agency announcement (BAA) February 3 for basic and applied research proposals. The mission of NSWC Crane is to provide acquisition engineering, in-service engineering and technical support for sensors, electronics, electronic warfare and special warfare weapons. NSWC Crane Division is seeking proposals specifically in the following basic research opportunity areas:

- "3-Dimensional Modeling, Simulation, and Visualization for Identifying Reliability Drivers and Aiding in Corrective Actions
- Investigating Radiation Effects in Quantum Information Technologies
- High optically transparent coating for electromagnetic interference (EMI) protection
- Spectrum Machine Learning"

NSWC Crane Division estimates total awards of $500,000 for each of the four research opportunity areas, with initial fiscal year (FY) 2020 awards estimated to be $60,000 for a performance period of seven months, with an option for follow on funding in FY 2021 not to exceed $440,000. All academic institutions are eligible to apply for the BAA, and Historically Black Colleges and Universities (HBCUs) and Minority Institutions (MIs) are encouraged to submit proposals and join others in submitting proposals. Federally Funded Research & Development Centers (FFRDCs) are not eligible to apply, although teaming is allowed. Full proposals are due on **March 4, 2020 by 2:00 PM EST** and must be submitted through www.grants.gov**.**

Sources and Additional Information:

- The full solicitation can be found on www.grants.gov under solicitation number "N00164-20-1-1001."

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The Foundation for Food and Agriculture Research Solicits Nominations for New Innovator Award

The Foundation for Food and Agriculture Research (FFAR) released its 2020 solicitation for the New Innovator Award. This award offers support to new faculty members in the first three years of their careers to "promote career advancement of highly creative and promising new scientists who intend to make a long-term career commitment to research in food and agriculture."

The 2020 New Innovator Award features two notable changes from past competitions: elimination of the one-to-one match requirement, and an increase in award size. Beginning in 2020, FFAR will increase the New Innovator Award size to $450,000 (up from $300,000), to better support smaller institutions. FFAR intends to award between 10 and 12 awards.

Eligible researchers must be nominated by their institutions, and institutions are limited to one nominee. Nominations will be accepted through March 4, 2020, and nominees will receive invitations to submit proposals by March 25, 2020, with full applications, by accepted nominees, due on May 6, 2020.

Sources and Additional Information:

- The call for nominations can be found at https://foundationfar.org/wp-content/uploads/2020/01/2020-NIA-Call-for-Nominations.pdf.
- Additional information on the New Innovator Award can be found at https://foundationfar.org/new-innovator-in-food-and-agriculture-research/.

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Administration and Agency Updates

PCAST and NSB Hold First Joint Meeting: Call for Action on STEM Education, Industries of the Future

Over the course of two days, the President's Council of Advisors on Science and Technology (PCAST) held a wide-ranging session, which included the first ever joint meeting with the National Science Board (NSB), to discuss policies and recommendations that the U.S. can enact to maintain its status as a leader in science and technology. Though many of the ideas discussed are in the early stages of development, the discussion gives critical insights on future ideas that may be key facets of the White House Office of Science and Technology Policy's (OSTP) thinking around U.S. priorities for science policy.

Dr. Kelvin Droegemeier, Director of OSTP and Chairman of PCAST, noted to PCAST members that he would like to develop specific actionable recommendations that the President could enact pertaining to three areas, each led by a PCAST subcommittee: STEM education and workforce development, industries of the future, and new models for partnerships for federal laboratories. By the end of the meeting, there was a clear consensus among Dr. Droegemeier and the PCAST members, as well as the NSB, that urgent action was needed to address federal STEM education and workforce efforts.

Further information on the discussion amongst these subcommittees can be found below.

Subcommittee on American Action Plan for Global Leadership in Industries of the Future (IOTF)

This PCAST subcommittee is exploring how the U.S. can maintain its advantage in Industries of the Future (IOTF), specifically for the fields of artificial intelligence (AI), quantum information sciences (QIS), next generation wireless (5G/NextG), synthetic biology, and advanced manufacturing. Led by Dr. Dario Gil from IBM, the Subcommittee intends to develop recommendations for federal and other sectors to lead in these areas, as well as an additional report on the convergence of these research areas and its implications for U.S. policy. The Subcommittee noted discussions on quantum computing and communications, as well as AI, were more advanced than other areas, and that the conversation around AI included the development of trustworthy, fair, and reliable AI systems. Some PCAST members expressed concern that one area where the U.S. was clearly behind was 5G. NSB members were supportive of these efforts but advised that the federal government should not lose sight of research efforts pertaining to other critical issues such as food, health and aging, water, energy, and education. Dr. Droegemeier noted that R&D to support IOTFs was an Administration priority and would be reflected in the fiscal year (FY) 2021 budget request.

Subcommittee on New Models of Engagement for Federal and National Laboratories in the Multi-Sector R&D Enterprise

This Subcommittee, led by Dr. Shannon Blunt from the University of Kansas, seeks to assess and understand how U.S. federal labs currently operate, conceptualize a model for how the federal laboratories could operate, and provide analysis of current gaps between these models to increase U.S. global competitiveness without fundamentally changing the mission of the labs. To develop short term recommendations, PCAST is specifically looking at policies in the following areas:

- Pipeline for early career researchers
- Ideas and intellectual property
- Facilities and instrumentation at laboratories
- Reducing risk

- Funding and oversight

PCAST specifically highlighted as an issue the atomization of budgeting at Department of Energy (DOE) labs, in which funding for the labs is allocated to specific research projects rather than to the lab directors. PCAST expressed concern that this prevents lab directors from having the flexibility to organize larger research initiatives. Some members also noted that simplifying the cooperative research and development agreement (CRADA) process to make it easier for labs to partner with other organizations.

The subcommittee also discussed a number of big ideas, which are currently in the early development stage:

- Develop a proposal for a *National Energy Act,* inspired by the *Commercial Space Launch Act*, to open up the DOE labs to industry and outside collaborations.
- Establish a national advanced manufacturing laboratory. This should not be duplicative of other programs like Manufacturing USA and should study and address all aspects of advanced manufacturing on a large scale.
- Establish a biotechnology laboratory, addressing a range of biology issues from the basic science of a cell to better understanding the impacts of a changing climate on the biosphere.
- Initiate efforts to advance digital healthcare.

Subcommittee on Meeting National Needs for STEM Education and a Diverse, Multi-Sector Workforce
STEM education and workforce development were identified as a key concern for both PCAST and NSB members, who noted in light of workforce concerns in the NSB Science and Engineering (S&E) indicators report that urgent action was needed to expand efforts to develop a STEM-capable workforce. To achieve this goal, the PCAST subcommittee, led by Ms. Cathy Bessant from Bank of America, will be developing formal recommendations to address all aspects of STEM education and workforce development, including:

- Extending private re-training commitments and scaling efforts
- Modernizing talent recruitment
- Strengthening the diversity & inclusion of underrepresented minorities
- Building opportunities in underserved regions
- Translating credentials between institutions
- Retaining foreign born talent in the U.S.
- Upskilling and reskilling the workforce
- Developing multisector partnerships to support the U.S. STEM workforce

The members discussed the challenge of developing recommendations that would achieve systemic changes at scale but expressed that there could be ways to leverage a large number of current successful programs across the country into a “What Works” list. NSB and PCAST members also discussed nontraditional paths for education, getting younger children and parents excited about STEM careers, and removing the stigma of community colleges and apprenticeship programs, among many other issues. Dr. Droegemeier noted that the White House would be looking to address this in a *Pathways to Prosperity* Initiative. During this discussion, OSTP noted plans to develop a website,

STEM.gov, that would serve as a clearinghouse for resources for parents, school systems, local governments, and others.

Other relevant discussions from the PCAST and joint meeting include:

- Leadership from NSB and PCAST discussed a number of areas where the two bodies could support mutual goals. NSB highlighted PCAST's ability to convene federal agencies and other partners beyond the National Science Foundation (NSF) and its connections to the industry as important assets that could support NSB's work. PCAST members also expressed the desire to leverage NSB's expertise, especially regarding current research around effective ways to teach STEM education, and its connections to the academic community.
    - Though federal regulations do not permit the two boards to form joint committees, both NSB and PCAST expressed enthusiasm for pursuing shared goals around STEM education and workforce development and building new innovative partnerships in the S&T community.
- NSB discussed its S&E Indicators Report and 2030 Vision. NSB expressed concerns that the U.S. was complacent in cultivating STEM talent in light of a globalizing S&T enterprise and a growing knowledge-based economy.
- NSB recommended that PCAST engage the Defense community and specifically engage with DOD's university-affiliated research centers (UARCs) on its efforts, noting that the Department will have a strong interest in all of the areas PCAST is currently working on.
- PCAST and NSB members stressed that these initiatives should seek to expand opportunities in rural and underserved regions, not just in Silicon Valley and on the coasts, and noted that cultivating talent in these areas would be critical to developing IOTF ecosystems.
- Dr. Droegemeier advised PCAST members that while there is a consensus on the importance of the U.S. maintaining its S&T leadership, PCAST should be able to frame its recommendations in a way that would be relevant to the general public, and be able to speak to jobs, opportunities, and improving the quality of life for all Americans.

About PCAST:
PCAST is a presidential-level advisory council made up of the Nation's science and technology leaders from the private sector and academic communities who "provide advice about science, technology, and innovation on topics critical to the Nation's security and economy, and the health and welfare of the American people." The Council's primary purpose is to provide policy recommendations on strengthening American leadership in science and technology, building the workforce of the future, and supporting foundational research and development across the country.

Current PCAST members include:

- Ms. Catherine Bessant, Chief Technology Officer, Bank of America,
- Dr. H. Fisk Johnson, Chairman, and Chief Executive Officer, S.C. Johnson & Son, Inc.,
- Dr. Dario Gil, Director of Research, IBM Research,
- Dr. Sharon Hrynkow, Senior Vice President for Medical Affairs, Cyclo Therapeutics,
- Dr. A.N. Sreeram, Vice President and Chief Technology Officer, Dow Chemical,
- Shane Wall, Chief Technology Officer and Global Head of HP Labs, HP Inc., and

- Dr. K. Birgitta Whaley, Director of Quantum Information and Computation Center, University of California, Berkley.
- Dr. Shannon Blunt, Professor of Electrical Engineering and Computer Science at the University of Kansas and Chair of the Radar Systems Panel of the Institute of Electrical and Electronic Engineers (IEEE), and
- Dr. Dorota Grejner-Brzezinska, Professor of Civil, Environmental, and Geodetic Engineering, The Ohio State University.

The President also intends to appoint two new PCAST members, though the new members were not yet sworn in during this meeting:

- Dr. Hussein Tawbi, Deputy Chairman of Melanoma Medical Oncology, MD Anderson Cancer Center
- Dr. Theresa Mayer, Executive Vice President for Research and Partnerships, Purdue University

Source and Additional Information:

- More information on PCAST, including a list of members, can be found here. A full agenda of the recent meeting can be found here.
- More information on the National Science Board, including a list of members, can be found here.
- NSB's S&E indicators report, "The State of U.S. Science and Engineering 2020" can be found here.

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USDA Releases Science Blueprint 2020-2025

On February 6, the Department of Agriculture (USDA) published a new strategic document to steer future science activities for the agency through 2025. The *USDA Science Blueprint* is intended to provide direction and focus as the agency strives for a more coordinated scientific enterprise. A primary goal of the document is the "unification of agency plans into the Department's plans" to better centralize strategic planning at all levels of USDA. Celebrating USDA's history of "moving science into practice," the *Blueprint* seeks to enhance the development and implementation of science-driven innovations by not only steering research priorities toward nationally significant targets but also remedying "bottlenecks" in the tech transfer process. Notably, the research priorities include an explicit emphasis on sustainability and climate adaption, including resilience, pest management, zoonotic and vector-borne disease, and conservation.

In addition to the agencies in the Research, Education, and Economics (REE) mission area, which include the National Institute of Food and Agriculture (NIFA), National Agricultural Statistics Service (NASS), Economic Research Service (ERS), and the Agricultural Research Service (ARS), the *Blueprint* also includes activities in the Forest Service, Food Safety and Inspection Service (FSIS), Natural Resources Conservation Service (NRCS), Food and Nutrition Service (FNS), and the Animal and Plant Health Inspection Service (APHIS). The *Blueprint* prioritizes the following five themes:

- Sustainable Ag Intensification: "Develop crop production systems and alternative strategies to intensify plant and forest production with continuous improvements and adoption of new technology and innovative practices while reducing environmental impacts."

- Ag Climate Adaptation: “Develop interdisciplinary integrative systems approaches to address environmental and management challenges that positively impact productivity and resilience.”
- Food and Nutrition Translation: “Generate fundamental knowledge and tools that later be applied to improve food safety and food security, including One Health research such as antimicrobial resistance.”
- Value-Added Innovations: “Strengthen food, agricultural, and forest production, processing, manufacturing, utilization, and marketing through new technologies, innovation, and data analysis to create jobs and economic opportunities in rural areas.”
- Ag Science Policy Leadership: “Encourage a global conversation and facilitate such discussion within decision-making bodies about literacy in agriculture, food, forestry, health, and science.”

The *Blueprint* highlights several cross-cutting “movements in science and agriculture” that will be central foci of investments and coordination efforts. These movements include open data, big data, artificial intelligence, gene editing, microbiome sciences, and technology, automation, and remote sensing.

While each thematic area in the *Science Blueprint* outlines broad objectives, strategies, and evidence-building activities for identified sub-themes, the document stops short of identifying future programmatic investments or clear actions for the agency.

Sources and Additional Information:

- A press release for the *USDA Science Blueprint* can be found at https://www.usda.gov/media/press-releases/2020/02/06/usda-casts-vision-scientific-initiatives-through-2025.
- The *USDA Science Blueprint* can be found at https://www.usda.gov/sites/default/files/documents/usda-science-blueprint.pdf.

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