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TUFTS UPDATE – DECEMBER 5, 2019
PREPARED BY LEWIS-BURKE ASSOCIATES LLC

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Introduction

This edition of the Tufts Washington Update for early December includes congressional updates, funding opportunities, and administration 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

Senate Subcommittee on Investigations Holds Hearing on China's Impact on the U.S. Research Enterprise

On November 19, the U.S. Senate Homeland Security and Governmental Affairs Committee's (HSGAC) Permanent Subcommittee on Investigations (PSI) held a hearing entitled, "Securing the U.S. Research Enterprise from China's Talent Recruitment Plans." The hearing included witnesses from the Federal Bureau of Investigation (FBI), National Science Foundation (NSF), National Institutes of Health (NIH), Department of Energy's (DOE) Office of Science, and the U.S. Department of State's Bureau of Consular Affairs (State). In conjunction with the hearing, a bipartisan PSI staff report, *Threats to the U.S. Research Enterprise: China's Talent Recruitment Plans*, was released. The committee also released two appendices with examples of talent recruitment contracts and case studies of recruitments.

The hearing focused primarily on the threat of foreign talent recruitment programs to federally funded research, and the report highlights the more than "200 talent recruitment plans—the most prominent of which is the Thousand Talents Plan." A major theme throughout the hearing was the slow recognition by the federal government and universities of the threat posed by talent recruitment programs and science and security issues in general. Agency officials explained that in the past, the focus was on dual-use technologies and issues of proliferation, but there is agreement that the threat is now better understood by the research community. Policymakers asserted during the hearing that participation in foreign talent recruitment plans incentivize participants to not disclose foreign sources of funding, to set up "shadow labs," to recruit other individuals, and often require the signing of non-disclosure agreements, among other requirements. Members and witnesses both noted how this stands in contrast to the norms and practices of the research community in the U.S.

While the focus of the hearing was on foreign talent recruitment programs, witnesses and Members commented on the instances of grant fraud, theft of intellectual property, violation of the peer review process, and other issues. As attention to talent programs and other science and security issues has increased, China has removed many public references to its talent programs. PSI Chairman Rob Portman (R-OH) was explicit in noting that recent efforts to address the protection of federally funded research are not seeking to target scientists of Chinese descent. The FBI witness also noted that "ethnicity plays no role in investigations."

Other issues raised during the hearing that had bipartisan support included the need to increase the vetting of visas. Senator Maggie Hassan (D-NH) expressed her support for increased resources to support visa security. Members, including Chairman Portman, observed that while increased attention to this issue by federal agencies and institutions is important, that it was time for specific policies, regulations, and legislation. One proposal discussed was adding technologies to the export-control list maintained by the Department of Commerce, which could then be used by the Department of State to deny visas to students or individuals coming to the U.S. to study or work on those technologies. Finally, both in the hearing and in the report, Chairman Portman made recommendations that federal grant agencies "harmonize the grant proposal process and standardize reporting requirements for disclosing all foreign conflicts of interest, conflicts of commitment, and all outside and foreign support." Additionally, "U.S. grant-making agencies conducting or funding U.S. government research should share information regarding grant recipients with access to U.S. government funding and research facilities."

The research agency witnesses all acknowledged the essential role that international collaboration and cooperation play in the scientific enterprise, as well as the importance of continuing our nation's openness to the world's best and brightest. They noted, however, the need for increased inter-agency coordination of grant policies and greater awareness of the security threat by research institutions.

Given the bipartisan congressional interest and concern with foreign threats to science and security, legislation is likely to be introduced. Potential areas that forthcoming legislation, policy, and regulations could address include harmonization among federal agencies around disclosures, restrictions on federal funding going to researchers involved in foreign talent programs, and increased disclosures on sources of funding.

Below are additional highlights from the federal witnesses:

John Brown, Assistant Director, Counterintelligence Division, Federal Bureau of Investigation (FBI)

- The FBI is seeking additional means to identify those targeting U.S. research discoveries.
- Each of the 56 FBI field offices has a taskforce, which works with a centralized counterintelligence national task force. Each field office has unique relationships with local institutions.
- The FBI is committed to working with the higher education research community to improve guidelines, and the Bureau has noted an improved willingness by institutions to address this issue.
- Engagement with the higher education research community is conducted through the FBI's Office of the Private Sector.
- The FBI was not at liberty to disclose in an open hearing how they are tracking talent programs given the secrecy around these programs now.

Rebecca Keiser, Office Head, Office of International Science and Engineering, National Science Foundation (NSF)

- NSF is committed to confronting the science and security threat and noted compliance with disclosure requirements is extremely important.
- A joint NSF- JASON advisory report is expected by the end of the year.
- NSF supports efforts to harmonize disclosure forms and is in the process of adopting the NIH Biosketch process in addition to sharing its own resources on conflicts of interest.
- NSF already requires responsible conduct of research training and could add ethical and research integrity training as part of that requirement.
- NSF also recognizes the need to provide modules to help institutions and ensure compliance.
- Increased federal funding in research and development is needed to respond to China's increased investment in science and technology.

Michael Lauer, Deputy Director for Extramural Research, National Institutes of Health (NIH)

- As of October 2019, seventy institutions have been contacted with specific NIH concerns.
- The current investigations caseload is in the hundreds, and NIH has currently identified 140 individuals of concern.
- NIH has seen significant violations of its Terms and Conditions as it relates to conflicts of interest and is training staff to report suspicious activity as it relates to the peer review process.
- Individuals who are guilty of infractions are a small percentage of those supported with NIH funds.

- NIH is developing resources to help investigators and is working with OSTP to better coordinate federal efforts.
- There is concern over the morale of foreign-born researchers and the need to continue U.S. collaborations with foreign countries.

Christopher Fall, Director, Office of Science, U.S. Department of Energy (DOE)

- The Administration is taking a "whole-of-government" approach to this issue.
- DOE is aware of instances where individuals at national labs have been offered hundreds of thousands and even millions of dollars to participate in talent programs.
- DOE will not allow national laboratory employees or contractors to participate in talent recruitment programs.
- DOE is looking at more than just foreign talent programs and is in the process of developing a technology matrix that identifies sensitive technologies, which will be used as a risk-assessment tool in determining access to these technologies.
- International collaboration and cooperation are essential to fundamental research.

Edward Ramotowski, Deputy Assistant Secretary for Visa Services, Bureau of Consular Affairs, State Department

- The State Department shares the concern of the PSI Subcommittee and applies a layered approach to visa and border security screening.
- Visa applicant screening cannot catch the threat alone, as researchers are often approached after their arrival in the U.S.
- State needs Congress to counter the false narrative that State is weaponizing visas against Chinese nationals.
- State intends to work much more closely with the FBI and Department of Homeland Security on these concerns.
- State would like Congress to provide more authority to the State Department for visa denials.

Sources and Additional Information:

- Opening statements, testimony, and video from the hearing is available at https://www.hsgac.senate.gov/subcommittees/investigations/hearings/securing-the-us-research-enterprise-from-chinas-talent-recruitment-plans.
- The PSI staff report is available at https://www.hsgac.senate.gov/imo/media/doc/2019-11-18%20PSI%20Staff%20Report%20-%20China's%20Talent%20Recruitment%20Plans%20Updated.pdf.
- "Majority and Minority Staff Report Appendix A - Threats to the U.S. Research Enterprise: China's Talent Recruitment Plans" is available at https://www.hsgac.senate.gov/imo/media/doc/2019-11-18%20PSI%20Staff%20Report%20-%20Appendix%20A%20-%20China's%20Talent%20Recruitment%20Plans.pdf.
- "Majority and Minority Staff Report Appendix B - Chinese Talent Recruitment Examples" is available at https://www.hsgac.senate.gov/imo/media/doc/2019-11-18%20PSI%20Staff%20Report%20-%20Appendix%20B%20-Chinese%20Talent%20Recruitment%20Examples.pdf.

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Funding Opportunities

ARPA-E Releases Second Funding Solicitation to Help Advance Fusion Energy

On November 7, the Advanced Research Projects Agency-Energy (ARPA-E) released a $30 million funding opportunity announcement (FOA) for a new program, Breakthroughs Enabling Thermonuclear Fusion Energy (BETHE). The BETHE program seeks to support the development and deployment of commercially viable nuclear fusion energy as a cost effective, reliable source of energy. BETHE also aims to employ high-risk, basic nuclear research to encourage private investment in later technological stages of fusion energy. The program will emphasize a "technology-to-market" focus through public, private, and philanthropic partnerships.

The BETHE program will focus on balancing cost metrics, such as overnight capital cost (OCC), with other lower-cost fusion concepts that would lead to a reliable, resilient, and efficient energy source. Targeted research areas include:

- new, lower-cost concept development;
- component technology development to lower the cost of more-mature fusion concepts; and
- improvements to and application of existing fusion R&D capabilities to accelerate the development of multiple concepts.

In the solicitation, ARPA-E notes that "riskier, early-stage development is supported primarily through federal funding, while performance and engineering scale-up is supported primarily through private investments."

The BETHE program is intended to be a successor to ARPA-E's earlier Accelerating Low-Cost Plasma Heating and Assembly (ALPHA, 2015–2019) program. Like BETHE, the ALPHA program sought to create low cost pathways to advance fusion research and was ARPA-E's first attempt at a fusion program. BETHE will build off the ALPHA program by attempting to better mitigate the "daunting scientific and technical risks" associated with nuclear fusion needed to achieve set milestones and a grid-ready demonstration.

ARPA-E intends to make approximately $30 million available. Individual awards may vary between $150,000 and $10 million, not including cost share. The period of performance for funding agreements may not exceed 42 months. This FOA is open to U.S. universities, national laboratories, industry, and individuals. The submission deadline for full applications is **January 14, 2020** at **9:30 AM ET**. Awards are likely to be announced in April 2020.

Sources and Additional Information:

- The full solicitation can be found at https://arpa-e.energy.gov/?q=arpa-e-programs/bethe.
- The press release from DOE's website can be found at https://www.energy.gov/articles/department-energy-announces-30-million-fusion-energy-rd.

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EDA Releases 2020 Public Works and Economic Adjustment Assistance Programs Solicitation

The Economic Development Administration (EDA) within the Department of Commerce (DOC) offers support for projects that enhance regional innovation and entrepreneurship, create jobs, and stimulate overall economic growth. The EDA Public Works and Economic Adjustment Assistance (EAA) programs

are signature initiatives at the agency that provide competitive funding for projects that leverage regional strengths to promote economic growth and resilience. Funding for this program had historically been reserved for the most distressed communities, but EDA has recently opened the program to include qualified Opportunity Zones, which can have a much lower threshold for distress.

Public Works and EAA programs fund similar activities with EAA focusing more on planning support and development strategies for regions facing challenging economic hardships. Given the substantial overlap between the programs, they are both included on the same solicitation which is typically released annually. Funding can include activities such as construction, non-construction (i.e. strategic development, infrastructure development strategies etc.), technical assistance, and revolving loan funds. For universities, this could include activities such as the development of innovation facilities, community economic development planning, tech upgrades, and more. Projects must be consistent with an existing comprehensive economic development strategy (CEDS) for the region.

Again, programs must support economically distressed regions. EDA defines distressed regions as having an unemployment rate for the most recent 24-month period that is at least 1 percent higher than the national average; per capita income that is 80 percent or less than the national average; or a "special need" identified by EDA. The special need criteria has been expanded in recent years to include coal communities, regions impacted by base closures and disasters, and Opportunity Zones. Proposals need strong buy-in from local communities to be successful.

Cost-Sharing: Applicants must demonstrate a strong cost-share from a non-federal source. Typically, an EDA award may not exceed 50 percent of the total cost of the project. A chart of expected cost shares based on a region's average per capita income or unemployment rate is provided in the solicitation.

Dates: Applications are accepted on a rolling bases; there are no deadlines for this solicitation.

Total Funding and Award Size: Fiscal year (FY) 2020 funding amounts are not yet known; however, this program is reliably supported by Congress. In 2019, EDA was appropriated $117.5 million for the Public Works program and $37 million for the EAA program. According to the solicitation, "the average size of a Public Works investment has been approximately $1.4 million, and investments generally range from $600,000 to $3,000,000. Historically, EDA has awarded funds for between 80 and 150 Public Works projects a year. The average size of an EAA investment has been approximately $650,000 and investments generally range from $150,000 to $1,000,000. Historically, EDA has awarded funds for between 70 and 140 EAA projects a year."

Sources and Additional Information:

- The full announcement is available at https://www.grants.gov/web/grants/view-opportunity.html?oppId=321695.
- Tools for calculating levels of distress can be found at https://www.eda.gov/pdf/EDA-Tools-1-pager.pdf.
- Additional information on establishing a CEDS can be found at https://www.eda.gov/ceds/.
- A searchable map of Opportunity Zones can be found at https://esrimedia.maps.arcgis.com/apps/View/index.html?appid=77f3cad12b6c4bffb816332544f04542.
- Additional Opportunity Zones resources and targeted federal funding opportunities can be found at www.OpportunityZones.gov.

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Department of Energy Releases Funding Solicitation for Energy Frontier Research Centers

On November 13, the Department of Energy (DOE) Office of Science issued a $40 million funding opportunity announcement for Energy Frontier Research Centers (EFRCs)—one of DOE's leading center-level competitions. DOE will accept proposals in only four topical areas: environmental management, quantum information science, microelectronics, and polymer upcycling. This is the first time DOE is soliciting proposals for microelectronics and polymer upcycling.

DOE expects to fund 10 to 20 new centers ranging from $2 million to $4 million each per year over four years for a total of $160 million, subject to Congress completing FY 2020 appropriations. In the 2018 competition, of the 42 centers, 30, or 71 percent, were awarded to universities and the remaining 12, or 29 percent, to DOE national labs. While well-suited for research universities, this is one of DOE's most competitive programs. The success rate in the last competition was only 17 percent. There are no cost share requirements, but a research university cannot submit more than two applications as the lead organization. A required pre-application is due on **January 16, 2020**.

Linked below is an analysis that provides more detailed information on key dates, each research topic, proposal requirements, and the review and selection process.

Sources and Additional Information:

- The funding opportunity announcement is available at https://science.osti.gov/bes/Funding-Opportunities.
- Lewis-Burke's analysis of the funding opportunity announcement is available at https://www.lewis-burke.com/sites/default/files/funding_opportunity_-_doe_releases_funding_solicitation_for_energy_frontier_research_centers.pdf.

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Department of Energy Releases Second Biological and Environmental Research Program Funding Call

The Department of Energy (DOE) released the second funding call under its biological and environmental research program. The $13.5 million funding call is for Atmospheric System Research on interactions between clouds and aerosols, atmospheric processes in the high Northern and Southern latitudes, and the development of new data products to render atmospheric data more usable and accessible to researchers. Studies can include observational research as well as the development of new modeling and analysis approaches based on existing observational data. DOE plans to make fifteen to twenty-four awards that range from $200,000 to $900,000 that would fund two-to three-year projects. Pre-applications are due **January 21, 2020** at 5:00 PM Eastern Time, and full applications are due **March 10, 2020** by 11:59 PM Eastern Time.

Sources and Additional Information:

- The funding call is available at https://science.osti.gov/-/media/grants/pdf/foas/2020/SC_FOA_0002198.pdf.

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Administration Updates

President's Council of Advisors on Science and Technology (PCAST) Holds First Meeting Under Trump Administration

The President's Council of Advisors on Science and Technology (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:

- 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.

On November 14, President Trump announced his intent to appoint two additional members from academia:

- 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.

Recognizing that there are only 14 months left in the Trump Administration and the slow start in convening PCAST, Dr. Kelvin Drogemeier, the Chair of PCAST and Director of the White House Office of Science and Technology Policy (OSTP), laid out a new approach for PCAST that would streamline and accelerate the process for PCAST to provide recommendations to him, the President, and executive branch agencies:

- There are no plans to draft and write long, detailed reports. PCAST members should be familiar with all prior PCAST and National Science and Technology Council reports and use them to guide federal strategies and approaches for advancing science and technology and workforce development. Instead, Dr. Drogemeier expects actionable policies and recommendations to execute science and technology strategies in the next year. In particular, he is interested in new or expanded approaches that expand private-public partnerships, improve coordination among federal agencies, and better utilize DOE national laboratories.
- Dr. Drogemeier is the only Chair of PCAST. There is no Co-Chair.

- PCAST will have a strong collaboration with the National Science Board to advance science and technology and focus on the future workforce. Members of the National Science Board briefed the PCAST members at this first meeting.
- Dr. Drogemeier announced the creation of the Student/Postdoc/Early Career (SPEC) Subcommittee to PCAST. This Subcommittee is made up of 20 members, co-chaired by a SPEC member and one PCAST member. The subcommittee will meet independently to develop recommendations and as well as jointly with the full PCAST to share its observations and recommendations. OSTP already selected the 20 members and is intended to be a diverse group. A multi-generational perspective is intended to improve policymaking.
- PCAST plans to meet three to four times a year in person and will have conference calls as necessary in between meetings. The next meeting will be in February 2020.

Over the next 14 months, Dr. Drogemeier would like PCAST to focus on two main taskings:

- Help develop a five-year strategy with single year execution plans, milestones, and deliverables to maintain U.S. leadership in five key industries of the future: artificial intelligence, quantum information science, advanced manufacturing, 5G, and synthetic biology.
    - PCAST members should keep in mind what big wins in science and technology would be for America in the 25 to 50-year horizon while thinking through short-term execution plans to put American on the right path today.
    - PCAST members expressed interest looking for opportunities for the convergence and intersection of the five key industries of the future. For example, some of the greatest promise is in digital healthcare by combining AI with synthetic biology or new materials for energy applications by combining advanced manufacturing with AI and quantum information science.
    - Another key to this success is likely to be improved public-private partnerships. A workshop in December at Stanford will explore new public-private frameworks for collaboration that would reduce impediments to collaboration between research universities, national laboratories, and the private sector. This framework would be a main point of discussion at a White House Summit in Spring 2020.
    - Dr. Droegemeier proposed the creation of Alpha Institutes at research universities that would fund high-risk, multi-disciplinary research in partnership with private industry to help explore new models of public-private partnership to advance science and technology and develop the workforce, while addressing intellectual property and other conflict of interest issues.
- Develop major policy recommendations to help prepare the American workforce for the industries of the future.
    - Dr. Droegemeier is interested not just in advancing STEM education programs from the high school to graduate level but also reskilling and upskilling as workers need to adapt to new science and technology through their careers.
    - Dr. Droegemeier expressed interest in a G.I.-type bill to build the workforce of the future that requires a whole of government approach as well as partnerships with private industry. Expanding a few fellowship programs will not be sufficient to address the challenge.

Dr. Drogemeier also shared the active work products at OSTP that can be resources to PCAST. PCAST is actively reviewing 35 science research areas, such as critical minerals, agricultural biotechnology, invasive species, nuclear energy, space science, and opioids. PCAST is also tracking 11 national security-

related issues, such as biodefense, cybersecurity, space situational awareness, quantum information science, and global health security and infectious diseases. The 11 priority technology areas include:

- Advanced manufacturing;
- Advanced transportation (UAS/UAV);
- Autonomy and AI;
- Big data;
- Connectivity and broadband;
- International science and technology;
- Intellectual property and patents;
- Lab to market;
- Privacy;
- Robotics; and
- Spectrum and telecommunications.

Sources and Additional Information:

- Additional information on PCAST is available at https://science.osti.gov/About/PCAST.

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