# Defense Overview: "Solving Problems with Science"

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Lewis-Burke Associates LLC April 2019



## About Lewis-Burke

- education areas
- research portfolio
- Able to engage on multiple levels:
  - Individual faculty (including early career faculty)
  - Teams of faculty
  - Associate Deans for Research
  - Deans and Center Directors
  - University leadership and campus-wide priorities/activities

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 Twenty-eight policy experts with range of expertise/backgrounds allow multilayered issue teams with deep expertise in agencies and scientific/higher

 Support federal relations activities to develop and implement federal strategies to pursue, shape, and create new sources of funding to increase and diversify

### Federal Funding Outlook

- FY 2020 Budget
  - -Congress will seek another budget deal to avert the return of sequestration in FY 2020 – fiscal "cliff" of \$126B needs to be addressed
  - –President's Budget Request for FY 2020 released March 11 – <u>adheres to budget caps</u>; uses war fund for defense; proposes cuts to many of the non-defense federal agencies of interest to the research, education and health communities
  - -Funding levels included in the request will largely be irrelevant, but will set the tone of the FY 2020 appropriations cycle
  - -House Budget Committee approved Two-Year Spending Caps Legislation: FY20 Defense +\$17 B; Non-Def +\$34 B

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# Department of Defense (DOD)

- Trump Administration prioritizing National Security Strategy modernization & invest in strategic weapons
- FY 2019 appropriations S&T Basic Research (6.1), Applied Research (6.2), and Advanced Technology Development (6.3) - \$15 billion; Basic research 8% increase over FY 2018
  - Additional funding spread evenly across Army, Air Force, and Navy (though ONR's gains were slightly larger)
  - Major increase for Basic Research Initiatives account
  - DEPSCOR program re-started
  - DARPA increased by 11% but no gains for Defense Research Sciences after major increases in FY 2018
- FY 2020 President's Budget Request (PBR)- S&T \$14.2 billion; Basic Research would receive \$2.3 billion, less than enacted, but 2% increase relative to FY 2019 PBR
- Future support for DOD funding in Congress unclear as Democrats assume control of House expected to bring greater scrutiny on defense spending
- DOD looking at policies for ensuring security of basic research in areas of national interest (NDAA language)

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# 2020 R&D Priorities

#### Major Areas of Interest:

- Autonomy and Robotics
- AI and Machine Learning
- Hypersonics
- DE Weapons
- Quantum
- Space capabilities
- Cybersecurity/Information Assurance
- Trusted Micro-electronics Materials/Manufacturing
- Test and evaluation science
- Expedited tech transition and acquisition
- STEM Education

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#### **SERVICES**

- -Air Force Space & 2030 study coming out
- -**Navy** unmanned systems portfolio to grow
- -**OSD**: Space Development Agency (\$105 million)
  - National security innovation network (\$25 million)
  - Space science and technology R&D (\$20 million)
  - Space science and technology prototyping (\$85 million)
  - Defense Innovation Unit Prototyping (\$92 million)
  - Joint Artificial Intelligence Center (JAIC) \$220 million



United States Department of Defense Fiscal Year 2020 Budget Request

-Army Reorganization of Research and Development organizations under Army Futures Command





# Basic Research Flagship Programs

- Multidisciplinary University Research Initiative (MURI) program supports research conducted by teams of investigators that intersect more than one traditional science and engineering discipline in order to accelerate research progress
- Defense University Research Instrumentation Program (DURIP) provides acquisition funding for equipment and instrumentation used to support defense-related research activities.
- Minerva Research Initiative initiated by former Secretary Gates in 2008, "seeks to build deeper understanding of the social, cultural, and political dynamics that shape regions of strategic interest around the world."
- Vannevar Bush Faculty Fellowship (formerly NSSEFF) provides extensive, long-term financial support to distinguished university faculty and staff scientists and engineers to conduct unclassified, basic research on topics of interest to DOD
- Young Investigator Programs (YIP) each of the Services and DARPA have early career programs to support faculty within a certain duration of receiving their PhD or being in a tenure track program LEWIS-BURKE

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### Applied/Advanced Technology Development Opportunities

- innovative technologies that can be rapidly inserted into acquisition programs that meet specific defense needs
  - Awards of up to \$3 million for 24 months or less
  - Selection preference to small business-led proposals
  - Proposals or projects should:
    - acquisition program
    - Stimulate innovative technologies, address technical risk
    - Reduce acquisition/lifecycle costs, improve timelines and thoroughness of test and evaluation outcomes
- its own SBIR/STTR solicitation open on an annual basis; often these funds go unclaimed
- operations
  - Training Technology Development; Surveillance, Collection, and Operations Support
  - full proposal (June-July)

- Proposers must register on BIDS: https://bids.cttso.gov/ LEWIS-BURKE

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• Rapid Innovation Fund (RIF) Annual BAA: Collaborative vehicle for small businesses to provide the department with

• Satisfy an operational or national security need, accelerate or enhance military capability, in support of a major defense

• Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR): Each Service manages

 Combating Terrorism Technology Support Office (CTTSO) Annual BAA: CTTSO identifies and develops capabilities to combat terrorism and irregular adversaries and to deliver these capabilities to DoD components and interagency partners through rapid research and development, advanced studies and technical innovation, and provision of support to U.S. military

-BAA topics include: Advanced Analytics; CBRNE; Improvised Device Defeat/Explosives Countermeasures; Investigative and Forensic Science; Irregular Warfare and Evolving Threats; Personnel Protection; Physical Security; Tactical Operations Support; • Each portfolio includes specified requirements and an unspecified requirement for proposals related to that topic

- Three-phase submission: One-page quad chart (Feb-March), then brief white paper no more than 12 pages (April-May), then





# **Prototyping/Demonstration Events**

- Army Expeditionary Technology Search (xTechSearch): \$1.95 million prize competition to help the Army enhance
  - Understanding the spectrum of technologies being developed commercially that may benefit the Army
  - Integrating the sector of nontraditional innovators into the Army's research and development ecosystem
  - Providing mentorship and expertise to accelerate, mature, and transition technologies of interest to the Army
  - Focused on six Army modernization priority areas
- defense problems; seeks primarily commercial products suitable for DOD use; uses OTA - https://www.diux.mil/work-with-us/companies
- thons" and Hacking 4 Defense
  - Three portfolios
    - Education
    - Collaboration
    - Acceleration

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engagements with the entrepreneurial funded community, small businesses, and other non-traditional defense partners, by:

• AFWERX, Service Rapid Acquisition Offices, Defense Innovation Unit: Pilot contracts for innovative solutions to posted

• MD5 National Security Technology Accelerator: Collaborative community for national security innovation; host of "Hack-a-

### FY19 ~ \$3.4 B; FY 2020 proposed ~ \$3.6 B Areas of Focus:

- Controlling Electro Magnetic (EM) Spectrum
- Distributed Lethality
  - -Sensing in difficult environments
- Space
  - -Small satellite constellations
- Hypersonics
  - -Missiles
- Trusted microelectronics
- Machine learning and Artificial Intelligence 3<sup>rd</sup> Wave/AI Next \$2 billion
- *Cyber, information assurance*
- Autonomous systems and counter-UAS
- New materials programs in FY 2019

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### • Artificial Intelligence

- -Machine Learning
- -Neural Networks
- –Human-Machine interactions
- Biology
  - -Neuroscience
  - -Infectious Diseases
  - -Synthetic Bio

## **DOD** Medical

- DOD Health Research Priorities: approximately \$2 billion invested
  - critical patients; alternatives to using anti-biotics for post wound care
  - (affordability); development of chronic traumatic encephalopathy (CTE)
  - Mental Health PTSD, suicide prevention; substance abuse, rural healthcare/telemedicine
  - Pain Management Burn care, opioid use
  - Infectious Disease prevention, diagnostics, therapeutics; surveillance; warfighter v. civilian health
  - Combat casualty care surgical systems and procedures, surgical en-route care, neurotrauma, minimizing blast-related injury
  - Health IT electronic health records, mobile health technology, telemedicine (in theater and at home)
  - Chemical, Biological, Radiological, and Nuclear (CBRN) Threats surveillance, prevention, detection, and treatment
- DoD Programs/Projects Program Area Directorates/Joint Program Committees
  - Combat Casualty Care
  - Radiation Health Effects
  - Military Infectious Diseases
  - Medical Simulation and Information Sciences
  - Military Operational Medicine
  - Clinical and Rehabilitative Medicine
- (CDMRP), as well as DOD basic research offices with some medically-oriented programs LEWIS-BURKE

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- Hemorrhage - blood products (storage, transportation, in theater transfusions); extend blood platelet shelf life; improved pre-hospital treatments for

- Traumatic Brain Injury (TBI) - classification of TBIs that can inform future technology and treatment strategies; biomarkers to replace CAT scans

• Work executed through U.S. Army Medical Research and Materiel Command (MRMC) & Congressionally Directed Medical Research Programs



# Areas of Interest

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### Cybersecurity –White House/DOD

infrastructure:

- -Defend the homeland by protecting networks, systems, functions, and data;
- -Promote American prosperity by nurturing a secure, thriving digital economy and fostering strong domestic innovation;
- -Preserve peace and security by strengthening the ability of the U.S. in concert with allies and partners to deter and, if necessary, punish those who use cyber tools for malicious purposes; and
- -Expand American influence abroad to extend the key tenets of an open, interoperable, reliable, and security Internet.

**DOD Cyber Strategy – "**defend forward, shape the day-to-day competition, and prepare for war" to compete, deter, and win in cyberspace

- -Ensure the U.S. military's ability to fight and win wars in any domain, including cyberspace
- incident
- -Continued functionality and ability to support DoD objectives in a contested cyber environment.
- -Named new Assistant Director for Cyber Daniel Ragsdale
- -Significant funding in FY2020 for operations, limited R&D funds (Army/Air Force)

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#### White House National Cyber Strategy – focuses on deterrence, interagency coordination, and protecting critical

-Preempt, defeat, or deter malicious cyber activity targeting U.S. critical infrastructure that could cause a significant cyber

-Strengthen cyber capacity, expand combined cyberspace operations, and increase bi-directional information sharing

# DHS Cyber Strategy

- GOAL: to protect critical systems, investigate cyber crimes, respond to cyber incidents, and federal enterprise, protect critical infrastructure, and provide tools for law enforcement.
- Five Pillars
  - internet.
  - assessments.

  - -Consequence Mitigation Cyber Physical System Security effort works to include security considerations into the structure of cyber physical systems, for instance IoT
  - -Enable Cybersecurity Outcomes utilizes Transition to Practice Program to disseminate government-funded cybersecurity applications across the market LEWIS-BURKE

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accomplish identified DHS cybersecurity objectives." R&D needs to develop capabilities to secure the

-Risk Identification - Application of Network Measurement Science seeks to construct technologies that would help identify, classify, report, predict, attribute and address events disruptive to the

-Vulnerability Reduction - Critical Infrastructure Design and Adaptive Resilient Systems project that aims to develop analytical tools and framework for facilitating cross-sector cybersecurity risk

-Threat Reduction - Anonymous Networks and Currencies and Cyber Forensics projects that aim to build platforms to support law enforcement entities in performing cyber and network investigations.

### DOD – AI/ML RESEARCH Themes

- autonomously that also can work along side warfighters
  - capabilities
  - -Navy pursuing fundamental and applied AI/ML for Naval applications
  - -Air Force exploit "data" and develop intelligent machine behaviors
  - -DARPA AI Next- explore how machines can acquire human-like communication and reasoning capabilities, with the ability to recognize new situations and environments and adapt to them
  - and where "the human brain doesn't have to work"

### All agencies pursuing how to team humans with technology

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 THEMES: Entering the second/third wave of automation centered on machine learning, artificial cognition, cheap sensors and distributed smarts. DOD seeks AI / ML for the development of systems that are capable of learning and making high-quality decisions

-Army - understand the fundamentals for Machine Intelligence and enhanced cognitive

-Strategic Capabilities Office - finding areas where AI can be injected onto existing systems

# DOD Autonomy R&D Themes

- THEMES: autonomy architectures; autonomous command and control; applying artificial intelligence/machine learning for
  - -Intelligent autonomy for safe, reliable, and scalable control of heterogeneous unmanned air systems based on high-level mission tasking
  - -Multi-vehicle autonomy; Swarming UAS
  - –Unmanned systems for undersea and surface warfare (large underwater vehicles)
  - -Robotics for Navy shipyards
  - -Soldier teammates



### Quantum

- Priority for the Trump Administration and Congress
  - OSTP QIS workshop held September 2018, and released National Strategic Overview for Quantum Information Science.
  - directs DOE, NSF, and NIST to spend \$1.3 billion on QIS R&D during the first five years of the initiative.

#### • NSF

- Big Idea in Quantum Leap. NSF plans to invest an additional \$30 million in FY 2019 on top of existing investments in all six of the research Big Ideas.
- over 5 years

#### • DOE

- DOE will invest \$105 million in FY 2019 to support fundamental research in quantum materials, computing, sensors, and communication.
  - FOA on quantum networking coming soon
  - SBIR solicitations coming
- DOE soon to release RFI on NQI Centers want broad community input
  - DOE plans to compete three QIS, multi-disciplinary, multi-institutional research centers focused on DOE mission needs in FY 2020.
- DOE will also continue to fund single PI and small group awards, as well as the six quantum science-focused Energy Frontier Research Centers.
- NIST
  - leadership
- DOD
  - Fellowship, single investigator grants and in-house laboratory programs.
  - Single investigator grants and in-house laboratory programs \$5.0 million added to service basic research offices
  - (BAA) for the Optimization with Noisy Intermediate-Scale Quantum devices (ONISQ)
  - FY 2019, plans for \$7.5 million for Air Force Quantum computing Center of Excellence.
  - Undersecretary for Research and Engineering, Dr. Mike Griffin, has appointment Dr. Paul Lopata as Assistant Director for quantum science

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- National Quantum Initiative Act establishes a 10-year interagency effort to accelerate QIS and technology development across the federal government. Language

- NSF has released a number of solicitations under the Quantum Leap Big Idea - latest Quantum Leap Challenge Institutes (QLCI): Up to 6 centers, \$5 million each

- Establishing Quantum Economic Development Consortium - led by SRI to develop common infrastructure/equipment needed by industry to move QIS and US

- DOD funding most efforts out of AFOSR, ARO, and ONR; plans to augment existing programs such as Multidisciplinary University Research Initiative, Vannevar Bush

- DARPA conducting workshops and listening sessions: RFI on Quantum Computing Applications with State of the Art Capabilities; **Broad Agency Announcement** 



### **Opportunities Ahead ON THE STREET**

- Department of Defense Releases DURIP BAA Department of Defense Releases MURI BAA
- ONR Manufacturing Engineering Education Program (**MEEP**)
- AFOSR YIP BAA
- Army Futures Command Releases BAA
- Military Medical Photonics Program
- DTRA Releases Three University Research Alliance Draft Solicitations
- DARPA DSO Announces Opportunity to Meet with Program Managers at Discover **DSO** Day
- DOD CDMRP Releases FY 2019 Solicitations
- DARPA MTO to Host Workshop for Actuation, Sensing, and Control for Rapid Injury Response
- DARPA BTO Releases BAA for Bioelectronics for Tissue Regeneration (BETR) Program
- ARO Releases BAA for DOD Advanced Computing Initiative (ACI)
- DARPA MTO Releases BAA for Digital RF Battlespace Emulator (DRBE) Program
- DARPA I2O Releases BAA for Guaranteeing AI Robustness against Deception (GARD) Program
- Army Research Institute for the Behavioral and Social Sciences Foundational Science **Research Unit FY19 BAA**
- ARL Collaborative Technology Alliances & Collaborative Research Alliances 2020 - DARPA DSO Releases Two Polyplexus Pilot Topics: Human Learning and Quantum Artificial Intelligence Innovation Institute (A2I2) Machine Learning
- DARPA and NSF Collaborate on Artificial Intelligence and Machine Learning Program;

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- DARPA MTO to Host Workshop for Actuation, Sensing, and Control for Rapid Injury Response
- DARPA MTO to Host Proposers Day for Automatic implementation of Secure Silicon (AISS)
- DARPA MTO Releases Two RFIs for Sensing and Manufacturing Capabilities for High-**Temperature Capable Electronics**
- IARPA Releases RFI on Innovative Technologies for Small Satellites

#### **ANTICIPATED OPPORTUNITIES**

- **MINERVA** Research Initiative FOA Expected This Month Topics released
- NHLBI and DOD CCCRP Announce Intent to Start Trans-Agency Blood-Brain Interface Program
- DARPA DSO to Release BAA for SAIL-ON Program
- New Air Force Centers of Excellence FY19 Quantum Computing
- DARPA to Release Electronics Resurgence Initiative (ERI) Phase II BAA
- DARPA to Release BAA for Technologies for Mixed-mode Ultra Scaled Integrated Circuits (T-MUSIC) Program
- DOD Releases Topics for 2019 Minerva Research Initiative; BAA Expected in April
- AFRL to Release BAA for Algorithm-Derived Decision Support
- IARPA Seeks Information on Camera Network Research Data Collection









## Meetings Ahead – Opportunities to engage

#### <u>April -</u> Fall

- The Navy League's Annual Sea-Air-Space Exposition, May 6-8, National Harbor, MD
- AFCEA Defensive Cyber Operations Symposium, May 14-16, Baltimore
- Defense Communities National Summit, <u>June 10-12</u>, Hyatt Capitol Hill
- JUNE: Discover DSO Day event scheduled for June 18-19, 2019 in Arlington, Virginia
- Summer: AFOSR Program Reviews
- August: Army Science & Technology Symposium & Showcase
- August: 2018 Military Health System Research Symposium, Orlando, Fla.
- NOV.: DTRA Chem Bio Defense S&T to Hold Conference

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# Steps to Effectively Engage DOD

- Meet program managers, laboratory subject matter experts, invite government researchers to give Department seminars – **Build relationships**, **Deliver**! -Attend formal opportunities, e.g. DARPA proposers days or the Air Force's programmatic reviews
- Attend conferences
- Review program websites, BAAs, and past solicitations to find relevant programs
- Submit white paper ahead of application to assess fit to program, get feedback, and potentially shape future solicitations
- Have more than one idea to propose Be prepared to adapt your research to meet program managers' goals
- Other considerations:
  - -Fellowships
  - -Postdoc Support (most if not all have support for rotations or funded support)
  - -Equipment (DURIP)
  - -Seed grants (flexibility)
  - -Small Business (different type of funding)

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# Ways to Propose

### White Paper Framed by *Heilmeier Questions*

- What are you trying to do? Articulate your objectives using absolutely no jargon. What is the problem? Why is it hard?
- How is it done today, and what are the limits of current practice?
- What's new in your approach and why do you think it will be successful?
- Who cares?
- If you're successful, what difference will it make? What impact will success have? How will it be measured?
- What are the risks and the payoffs?
- How much will it cost?
- How long will it take?
- What are the midterm and final "exams" to check for success? How will progress be measured?

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Quad Char

Forma

BAA Number: (Number of the BAA Announcement Mission Area: (Title of Mission Area from BAA Package) Requirement Number: (Only 1 Per Chart)/(Document Identifier) (See para 3.1.5.1) Proposal Title: (Brief/short Title to describe offeror's proposed effort)

<u>Photograph</u> or artist's concept of the project end- item. Ideally, this will convey the main idea of the final capability/use of the prototype. It should further give an idea of the size and weight of the end item.		Operational Capability: Describe how the system would provide new or enhanced operational capability to user agencies. Describe system specifications to be met. If known, list specific agencies that have expressed interest in this approach.	1
Proposed Technical A Specifically, how will the approached. Describe tasks to be p Describe any actions of Describe any related of offeror. Describe the technolo be used to solve the p	oproach: ne problem be erformed. done to date. on-going effort by the gy involved and how it will roblem.	Rough Order of Magnitude Cost and Schedule:     Provide any milestone decision points that will be required. Describe period of performance and total costs. If there are phases, provide funding per phase.     Deliverables:     Include all hardware and the following data deliverables: monthly status report, final report, test plans, test reports, specifications, computer program end items, user's manual, drawings, transition plan. etc	
STATUS QUO	Pr What is the state of the art and what are its limitations ? (DELETE THIS BOX OF TEXT AND INSERT DIAGRAM(S) Primary answer here. Add more text as necessary.	Coject/technology title	
`	First bullet point Additional as necessary  What are the key new insights?	HOW IT WORKS: Placeholder explanatory text paragraph. Replace with text and diagrams as necessary.	Ing .
VEW INSIGHTS	(REPLACETHIS BOX AND INSERT DLAG RAM(S)) First key insight. Add more text as necessary. Second key insight. Add more text as necessary. • Add other points as necessary	ASSUMPTIONS AND LIMITATIONS: • Limitation or assumption • Another limitation or assumption	END-OF-PHASE GOAL

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# BACKUP



# Signature Funding Mechanisms

#### Standard grants and contracts

- Broad Agency Announcements (BAA) or Funding Opportunity Announcements (FOA)
- Summer faculty research opportunities
- academia, and the government for 5-8 years at \$3 million to \$8 million per year
- Air Force Center of Excellence (COE) AFOSR + AFRL
- - of traditional contracts, grants, or cooperative research and development agreements.
- University Affiliated Research Centers (UARC)
- Indefinite Delivery Indefinite Quantity (IDIQ) contracts
  - Indefinite quantity of services for a fixed amount of time; government places task orders against basic contract with broad scope
  - Streamlines contract process and speeds delivery of services
  - Most often used for service contracts and architect-engineering services

#### Small Business Innovation Research and Small Business Technology Transfer (SBIR/STTR)

- SBIR/STTR facilitates cooperative R&D between small businesses and U.S. research institutions
- STTR

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- Special program announcements (e.g. Minerva, Multi-disciplinary University Research Initiative (MURI), Young Investigator Programs)

### Army - Cooperative Research Agreement (CRA)/Collaborative Technology Alliance (CTA) - Collaboration between industry,

• Other Transaction Authorities (OTA) - procurement instruments other than contracts, grants, or cooperative agreements enabling flexible business arrangements to acquire research and development to support technology advancement or to quickly develop a prototype.

- Mechanism to access innovative research and development from non-traditional contractors who are challenged by the standard requirements

- 11 federal agencies participate in SBIR (FY 2015: \$1 billion at DOD; \$800 million at HHS; \$200 million and DOE); 5 federal agencies participate in

# **Big Data / AI / Machine Learning**

- performance computing advances.
- February 2019 Executive Order on Al
- the Big Ideas.
  - mechanism for NSF, which will be focused on translational and applied research.
- - assistance and disaster relief capabilities.
    - solve.
    - compared to the private sector
- DOE AI and machine learning a top research priority both for applied mathematics to better understand deep learning and for solar and geothermal plants)
- Bruce Tromberg, is biomedical engineer with background in biophotonics, wants to focus on data and modeling

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• Data-related research is a priority for the Trump Administration, including artificial intelligence (AI), machine learning, and high-

• **NSF** has Big Ideas in Harnessing the Data Revolution for 21st-Century Science and Engineering (HDR) and the Future of Work at the Human-Technology Frontier (FW-HTF). NSF plans to invest an additional \$30 million in FY 2019 on top of existing investments in all

- HDR and FW-HTF would be the two topics of the new "Convergence Accelerators." Convergence Accelerators are a new

– HDR and FW-HTF are also a big focus of NSF education programs, including the NSF Research Traineeship (NRT) program • DOD – Machine Learning / AI is a priority area - DOD released its AI Strategy February 12 – focus on technologies to operations. - DOD formed the Joint Artificial Intelligence Center (JAIC) to facilitate the delivery of new AI enabled capabilities to include tools that can be integrated into DOD operations, with current examples being predictive maintenance of DOD systems and humanitarian

• DARPA – AI Next leads R&D efforts for DOD - investing in foundational research to address problems that industry is not going to

• Defense Innovation Unit - works to acquire technologies from industry and gauges the state of the Department's technology

applications for energy (recent solicitation on Al/machine learning for materials and chemistry research as well as improved operations

• NIH – released new Strategic Plan for Data Science in June 2018, but data management remains fragmented across agencies; NIH is recruiting new Chief Data Strategist and Director; BRAIN Initiative includes focus on data and machine learning; new NIBIB Director,

### Young Investigator Programs

**Office of Naval Research -** The Office of Naval Research's (ONR) Young Investigator Program (YIP) seeks applicants in their first or second full-time tenure-track position. The program seeks "to attract outstanding faculty members of Institutions of Higher Education to the Department of Navy's research program, to support their research, and to encourage their teaching and research careers." ONR seeks YIP proposals related to the research areas of interest to each of the science and technology departments. ONR utilizes an annually released funding opportunity announcement (FOA) to solicit YIP proposals and funds projects up to \$170,000 per year for three years. ONR generally releases the FOA in the summer, with proposal deadlines in September.

Sources and Additional Information:

- Additional information on ONR's YIP is available at https://www.onr.navy.mil/Science-Technology/Directorates/office-research-discovery-invention/Sponsored-Research/YIP.aspx.
- The research areas of interest to ONR can be viewed through the multiple science and technology departments at https://www.onr.navy.mil/en/Science-Technology/Departments.

Air Force Office of Scientific Research - The Air Force Office of Scientific Research (AFOSR) YIP supports scientists and engineers who received their Ph.D. in the last five years. The program's objectives are "to foster creative basic research in science and engineering; enhance early career development of outstanding young investigators; and increase opportunities for the young investigator to recognize the Air Force mission and related challenges in science and engineering." AFOSR's YIP provides \$120,000 over three years. AFOSR seeks YIP proposals that address research topics listed in its broad agency announcement (BAA) titled "Research Interests of the Air Force Office of Scientific Research." AFOSR solicits YIP proposals through a solicitation that is typically released in April, with proposal deadlines in June.

#### Sources and Additional Information:

- Additional information on AFOSR's YIP is available at https://community.apan.org/wg/afosr/w/researchareas/12792/young-investigator-program-yip/.
- The Research Interests of the Air Force Office of Scientific Research BAA is available at https://www.grants.gov/web/grants/view-opportunity.html?oppId=285269.

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### Young Investigator Programs

Army Research Office - The Army Research Office's (ARO) YIP supports tenure-track faculty who are less than five years from receiving their Ph.D. ARO solicits proposals for its YIP through its broad agency announcement (BAA) which is currently open through March 2022. Research areas of interest to ARO are listed in the BAA.

Sources and Additional Information:

• Information on ARO's YIP is included in their long-standing BAA which is available at http://www.arl.army.mil/www/pages/8/W911NF-17-S-0002.pdf.

**DARPA** - annually aims to identify and engage elite researchers in junior faculty or equivalent positions at academic and non-profit research institutions and expose them to the Department of Defense's (DOD) mission, challenges, and needs.

- institutions
- Provides \$500,000 over two years.

Sources and Additional Information:

- Additional information on DARPA's YFA is available at https://www.darpa.mil/work-with-us/for-universities/young-faculty-award



• Limited to current tenure-track Assistant or Associate Professors and to tenured Assistant or Associate Professors within three years of their tenure appointment at a U.S. institution of higher education or equivalent at a U.S. non-profit science and technology research

The most recent DARPA YFA solicitation is available at https://www.fbo.gov/index?s=opportunity&mode=form&id=a35ed12671b7cd68049406a6d150b45d&tab=core&\_cview=0.

### **ONR Young Investigator Program – Best** Practices **Successful Candidates**

• proposal

- PO comment: "if only they would have contacted me first this would have been a great proposal!!"
- Try to understand PO's portfolio / interests
- Review ONR website; become familiar with Navy terminology / where your technology fits in
- A record of publishing in peer reviewed journals
- Strong letter of support from University and/or Department (for Young Investigator Program)
- A complete curriculum vitae submitted with white paper and/or proposal package **Distribution Statement A: Approved for public release**



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**Contact ONR Program Officer before submitting** 

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### Program Area Management Structure

#### Weapons Systems & Platforms



### Resource Conservation & Resiliency



### Environmental Restoration





### Munitions Response



# Department of Homeland Security (DHS)

- million more than the FY 2019 request
- S&T priorities
  - -Cargo and point-of-entry security
  - Opioids/fentanyl detection
  - Soft targets and crowded places
  - -Cyber physical systems
  - First responder technologies
  - -Explosive threat assessments
  - -Counter-unmanned aircraft systems
  - -Canine detection
- - typically holds new competitions for existing topics when a COE expires in an established priority.

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• Congress had restored several funding cuts proposed by the Administration, **\$820 million** for Science and Technology (S&T) - \$237

• University-based DHS Centers of Excellence (COEs) program funded at \$40.5 million. COEs bring together many university, industry, national laboratory, and non-profit partners to conduct research and development activities and training programs.

– DHS's Office of **University Programs** (OUP) maps out their planned topic areas and COE competitions in advance. The agency

• Next COE competition is expected in 2019. Topics are uncertain, possibly **First Responders** or **Counterterrorism** 





# Department of Defense Reorganization



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----- Lines of Authority, Direction, and Control

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