DHS SCIENCE AND TECHNOLOGY

Office of University Programs Centers of Excellence

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Homeland Security

Science and Technology

Science & Technology Directorate Overview

A start-up operation for DHS at its inception in March 2003

Whose authority derives from the Homeland Security Act of 2002, Title III: Science and Technology in Support of Homeland Security

And acts as the Science Advisor to Secretary and Research & Development arm of DHS

To enable research, development, test and evaluation and the timely transition of homeland security capabilities to operational end users

By marshalling the intellectual capital of the scientific and engineering communities to develop solutions

S&T in Brief

Enable effective, efficient and secure operations across all homeland security missions by applying scientific, engineering, analytic and innovative approaches to deliver timely solutions and support departmental acquisitions.

- **Laboratories**
  - 5 internal Labs, 2 Federally Funded R&D Centers, access to DOE Labs
- **Centers of Excellence**
  - Network of university-based COEs
  - Multidisciplinary research and education in homeland security-related fields
- **Collaborates across sectors to develop, leverage, transition capabilities**
  - Components, State/Local, Interagency, International, Private Sector, Academia
- **Supports DHS, Components and HSE requirements**
  - Key technical and analytical capacity in major threat areas
  - Innovative approaches to problem solving and affordable, viable solutions
- **Establish enduring capability in homeland security science and technology**
  - Prepare future generations to meet homeland security challenges

S&T Programs

Office of Industry Partnerships

Industry Partnerships (OIP) engages industry stakeholders to identify, develop and deliver cutting-edge technologies for the homeland security mission and transition federally-funded mature technology into the marketplace.

OIP works with S&T groups to accomplish its mission and engages other federal agencies, industry, academia and international partners to develop and deliver emerging homeland security technology solutions.

OIP offers a streamlined approach to contracting effectively and sponsored research vehicles.

Long-Range Broad Agency Announcement

The Long Range Broad Agency Announcement (LRBAA's) is a standing, open invitation for researchers and scientists to contribute their best ideas that address Department of Homeland Security capability gaps.

It is a funding mechanism, not a program, for novel and innovative concepts. The Long Range BAA is an open, peer-reviewed competition of ideas to encourage researchers to pursue their creativity and innovations. All S&T's divisions and special programs may receive, evaluate, and fund research and development projects through the LRBAA.

Ideas and opportunities for research efforts can be managed by S&T through multiple avenues – universities and higher education institutions are perfect proving grounds for developing these novel approaches

S&T Office of University Programs

Bringing Innovation to Operations

OUP | OFFICE OF UNIVERSITY PROGRAMS

S&T OUP manages a complex and broad portfolio of scientific investments focused on the investigation, experimentation, and evaluation of emerging science and technology in response to DHS Component needs.

Objectives:

- Build a stable community of homeland security researchers and educators at U.S. colleges and universities capable of providing DHS with novel insights and approaches in diverse scientific domains.
- Develop a permanent homeland security science and engineering workforce.
- Generate, advance, and disseminate knowledge, prototypes, and technologies in support of DHS Component identified operational and strategic challenges.
- Strengthen the U.S. scientific leadership in homeland security research and education.

CENTERS OF EXCELLENCE

The COE network is a consortium of hundreds of universities conducting ground-breaking research to address homeland security challenges

EDUCATION & WORKFORCE DEVELOPMENT

OUP initiatives educate and train the current and future workforce in science and engineering professions

MINORITY SERVING INSTITUTIONS

OUP builds a cadre of university students and faculty who are well-qualified, diverse, and ready to enter the homeland security workforce

The DHS Centers of Excellence Program

- There are 10 multi-disciplinary COEs; 9 are currently active, with one in the planning phase to be launched in 2020. S&T maintains five Emeritus COEs that DHS can access via contracts for direct ordering.
- COEs are distinct research and education assets established to serve DHS as a network, study difficult operational and strategic problems, test technical solutions, and recommend potential solutions.
- S&T OUP provides key strategic, technical, and administrative oversight of the COEs. A U.S- based, accredited academic institution is competitively selected to run a COE and network of performers.
- Through this decentralized network, the COEs and DHS work together to explore, experiment, and evaluate innovative ideas to address mission needs.
- The S&T OUP uses four types of funding mechanisms for federal financial assistance: Grants, Cooperative Agreements*, Contracts, and Basic Ordering Agreements (BOAs). **Cooperative Agreements are the primary funding vehicle used to fund COEs*

10 Centers of Excellence providing specialized, multi-disciplinary research in cross-component mission areas

119 Active research projects working to help DHS understand emerging science and technology

91 Senior officials from DHS Components strategically advising on the R&D portfolios

200+ Academic, private sector, and international partners within the current COE network delivering insights into science and technology

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DIVERSE PERSPECTIVES + SHARED GOALS = POWERFUL SOLUTIONS

Department of Homeland Security Centers of Excellence Partnership Network

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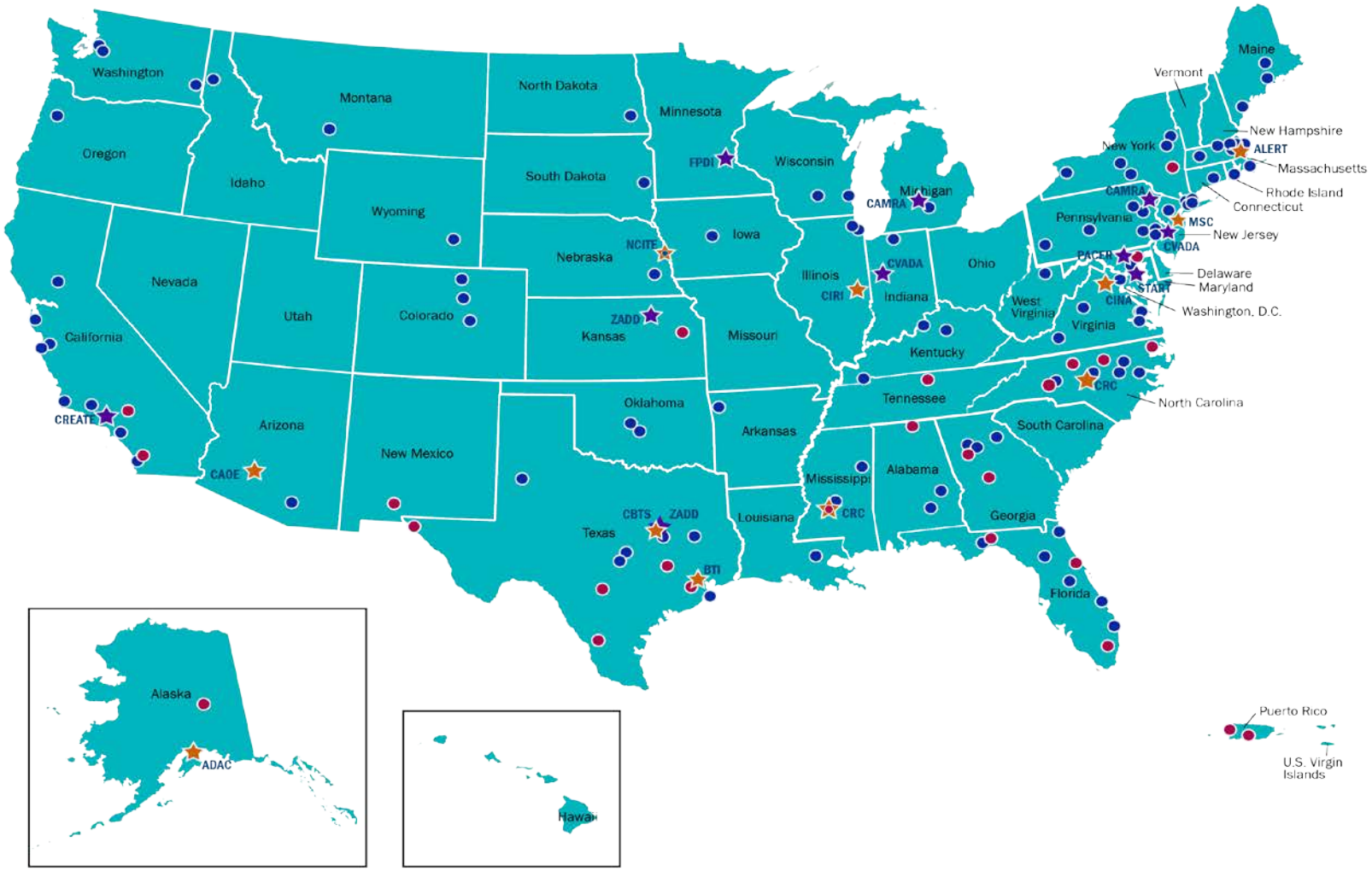

LEGEND

- CURRENT COE
- EMERITUS COE
- UNIVERSITY PARTNER
- MINORITY SERVING INSTITUTION

Current Centers of Excellence

ADAC - Arctic Domain Awareness Center
ALERT - Center of Excellence for Awareness & Localization of Explosives-Related Threats
BTI - Borders, Trade, & Immigration Institute
CAOE - Center for Accelerating Operational Efficiency
CBTS - Cross-Border Threat Screening and Supply Chain Defense
CINA - Criminal Investigations and Network Analysis Center
CIRI - Critical Infrastructure Resilience Institute
CRC - Coastal Resilience Center
MSC - Maritime Security Center
NCITE- National Counterterrorism Innovation Technology Education Center

Emeritus Centers of Excellence**

CVADA - Center for Visualization and Data Analytics
CREATE - Center for Risk and Economic Analysis of Terrorism Events
FPDI - Food Protection & Defense Institute
PACER- National Center for the Study of Preparedness and Catastrophic Event Response
START - National Consortium for the Study of Terrorism and Responses to Terrorism
ZADD - Center for Zoonotic and Animal Disease Defense

COE Topic Alignment to Mission

COE TOPICS	PREVENT TERRORISM & ENHANCE SECURITY	SECURE & MANAGE OUR BORDERS	ENFORCE & ADMINISTER OUR IMMIGRATION LAWS	SAFEGUARD & SECURE CYBERSPACE	NATIONAL PREPAREDNESS & RESILIENCE
LAW ENFORCEMENT INVESTIGATIONS		✓	✓	✓	
ARCTIC DOMAIN AWARENESS	✓	✓	✓		✓
APPLIED QUANTITATIVE ANALYSIS	✓	✓	✓	✓	✓
COUNTERTERRORISM	✓				✓
COUNTERING BIOTHREATS	✓				
TRANSPORTATION SECURITY AND SCREENING	✓				
MARITIME DOMAIN AWARENESS	✓	✓	✓	✓	✓
BORDER SECURITY, TRADE AND IMMIGRATION	✓	✓	✓		
INFRASTRUCTURE PROTECTION AND RESILIENCE	✓			✓	✓
NATURAL HAZARDS AND RESILIENCE					✓

Workforce & Professional Development Initiatives

Workforce Development

- Create skilled university graduates and prepare them for the workforce through internships, fellowships and post-graduate opportunities
- Financially support students, provide students with experiential learning opportunities, and develop course content at the COEs and MSIs

Professional Development

- Increase use of COE-developed courses and training materials by current DHS science and engineering professionals
- Develop continuing education science and engineering courses, seminars and certificates for DHS staff

CRITICAL INFRASTRUCTURE

CIRI

RESILIENCE INSTITUTE

Led by the **University of Illinois Urbana-Champaign**, CIRI conducts research and education to enhance the resiliency of the nation's critical infrastructures and the businesses and public entities that own and operate those assets and systems. The Institute explores the organizational, policy, business, and technical dimensions of critical infrastructure's dependence on cyber assets. CIRI also examines how cyber assets both contribute to and threaten resiliency and how industry makes decisions about cyber risk management.

CIRI's customer-driven research topics include:

- Building business cases and market incentives for enhanced security and resilience
- Informing policy, regulations, and standards to augment and support business case
- Building tools and technologies needed to enhance security and resilience
- Educating and developing an engaged and resilience-focused workforce

CIRI works closely with:

- Cybersecurity and Infrastructure Security Agency (CISA)
- Federal Emergency Management Agency (FEMA)
- U.S. Coast Guard
- Private sector

CENTER FOR ACCELERATING

CAOE

OPERATIONAL EFFICIENCY

Led by **Arizona State University**, the Center for Accelerating Operational Efficiency (CAOE) develops innovative approaches to enhance and streamline homeland security operations. The research, systems, and technology created at CAOE provide the U.S. Department of Homeland Security with dynamic information and predictive tools to help resource and response planning, risk analysis and real-time decision-making

CAOE's customer-driven research topics include:

- Predictive Analyses
- Threat Screening and detection optimization
- Risk and cost analysis
- Education and training for the current and future homeland security workforce

CAOE works closely with:

- U.S. Customs and Border Protection (CBP)
- Transportation Security Administration (TSA)
- Cybersecurity and Infrastructure Security Agency
- Federal Emergency Management Agency
- DHS Office of Intelligence and Analysis
- DHS Procurement Innovation Lab
- U.S. Central Command
- U.S. Pacific Command

COASTAL RESILIENCE CENTER

CRC

Led by the **University North Carolina at Chapel Hill,** CRC conducts research and education to enhance the resilience of people, infrastructure, economies, and the natural environment to the impacts of coastal hazards such as floods and hurricanes,

CRC's customer-driven research topics include:

- High-resolution coastal flood, storm surge, and wind forecasting
- Hazard mitigation and recovery planning
- Educating and developing an actively engaged and resilience focused workforce

CRC works closely with:

- Federal Emergency Management Agency (FEMA)
- Cybersecurity and Infrastructure Security Agency (CISA)
- U.S. Coast Guard
- Private sector.

SECURITY TECHNOLOGY TRANSITION

STT MBA

Masters of Business Administration (MBA) program

DHS S&T OUP will establish a COE at an accredited U.S. university that will offer a concentration in Security Technology Transition (STT) within its Masters of Business Administration (MBA) program.

This program will be built upon a foundation of innovation and management and address R&D-centric topics such as:

- Advanced Strategy and Analytical Decision Making
- Product Design and Development
- Research and Development Contracting
- Intellectual Property Management
- Research Validation and Technology Testing and Evaluation (T&E)

This program will educate DHS professionals in fundamental business disciplines through DHS-centric case studies while providing access to specialized courses focused on advancing skills needed to manage the complexities associated with advancing scientific and technical ideas from the laboratory to the field.

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