



Department of Homeland Security Science & Technology

Overview to the US National Committee on Theoretical
and Applied Mechanics, April 22, 2016, Washington DC



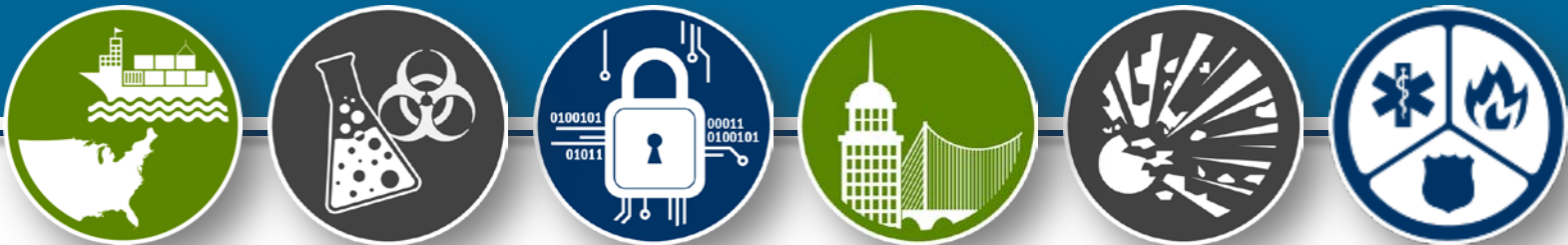
**Homeland
Security**

Science and Technology

Dr. Kevin L. Brown
Chief Scientist, DHS/S&T

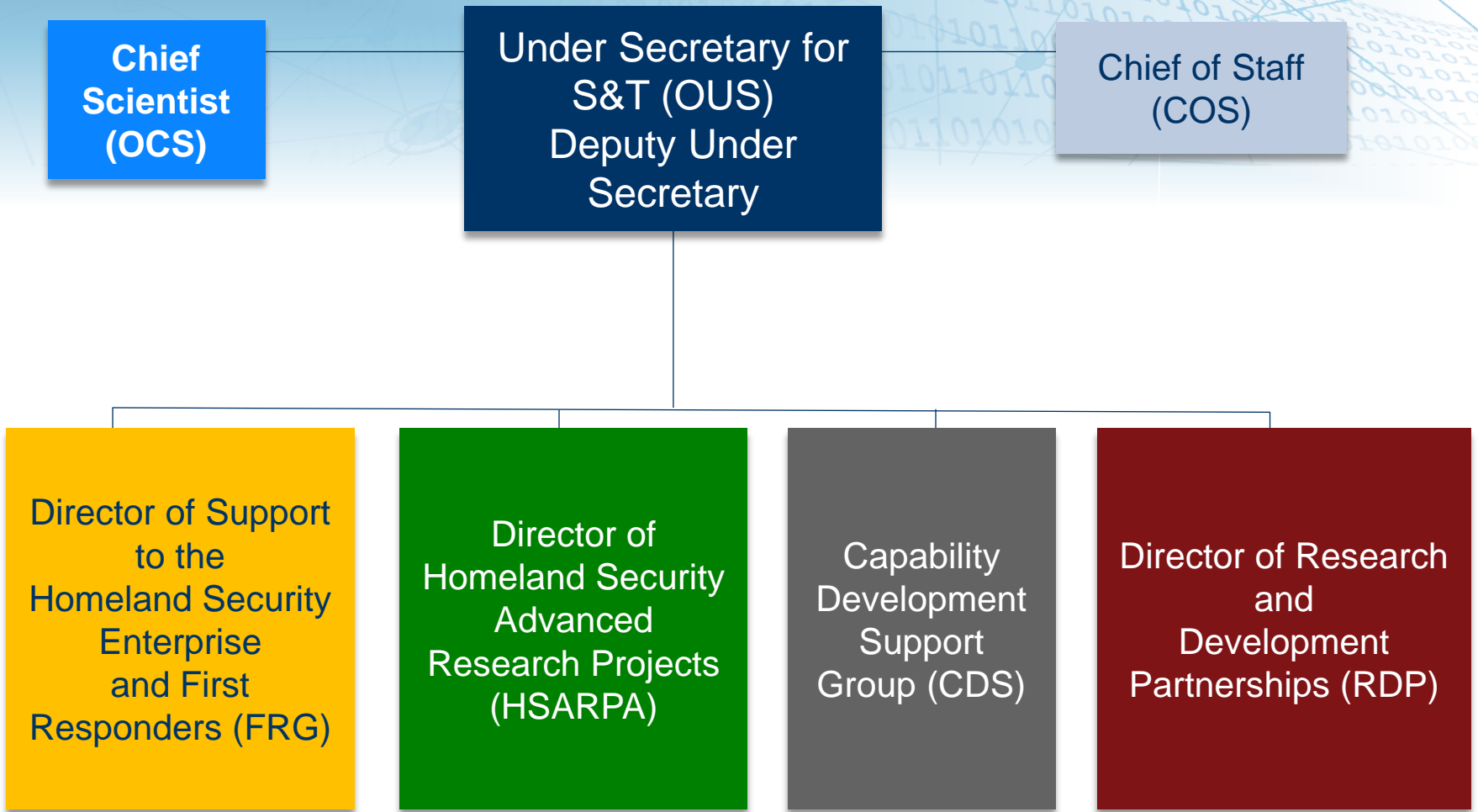
S&T Mission

To deliver effective and innovative insight, methods and solutions for the critical needs of the Homeland Security Enterprise.



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S&T's Five National Laboratories



**Chemical Security
Analysis Center**
Baltimore



**National Urban Security
Technology Laboratory**
New York City



**National Biodefense
Analysis and
Countermeasures Center**
Manhattan, KS

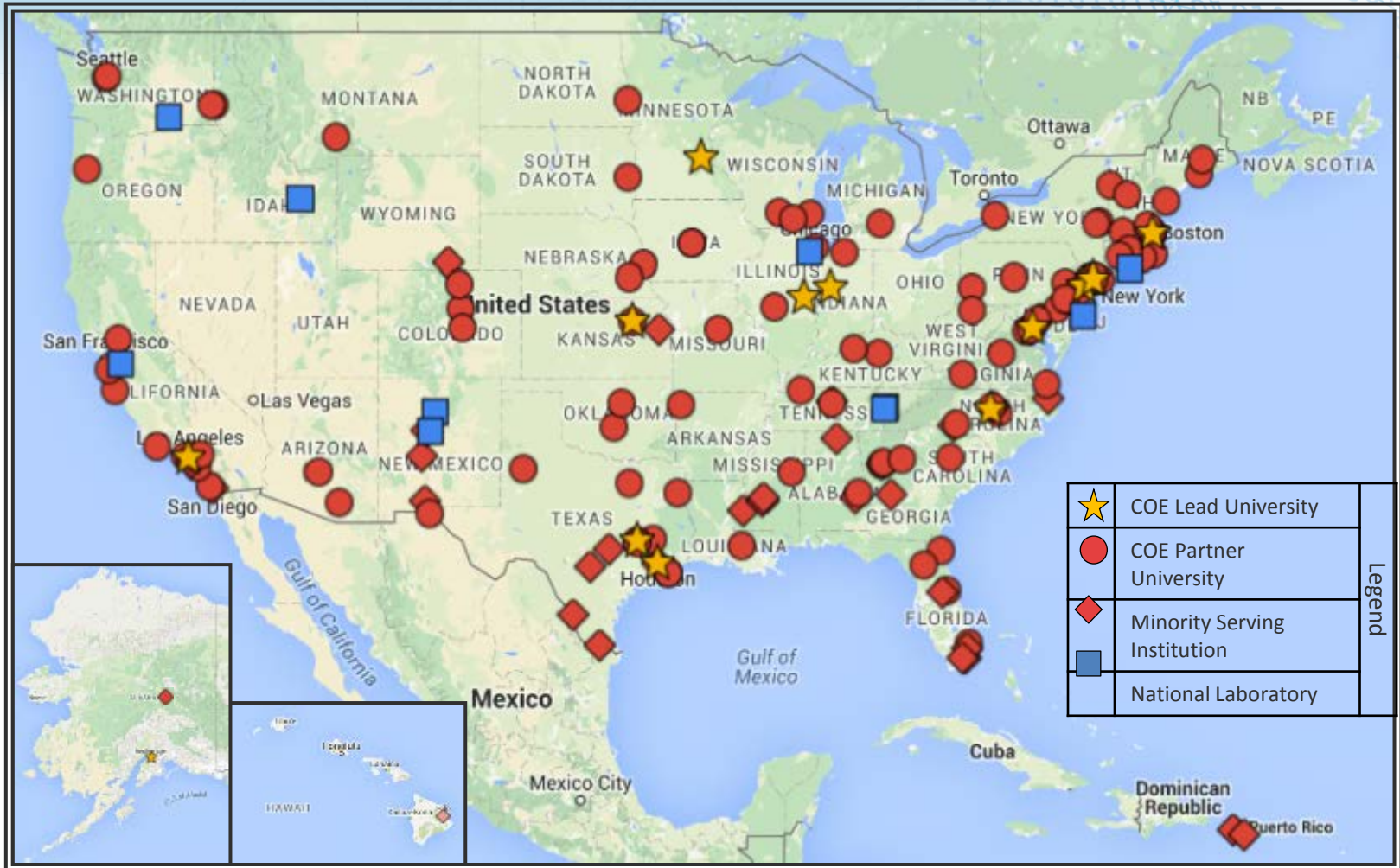


**Plum Island Animal
Disease Center**
New York



**Transportation
Security Laboratory**
Atlantic City

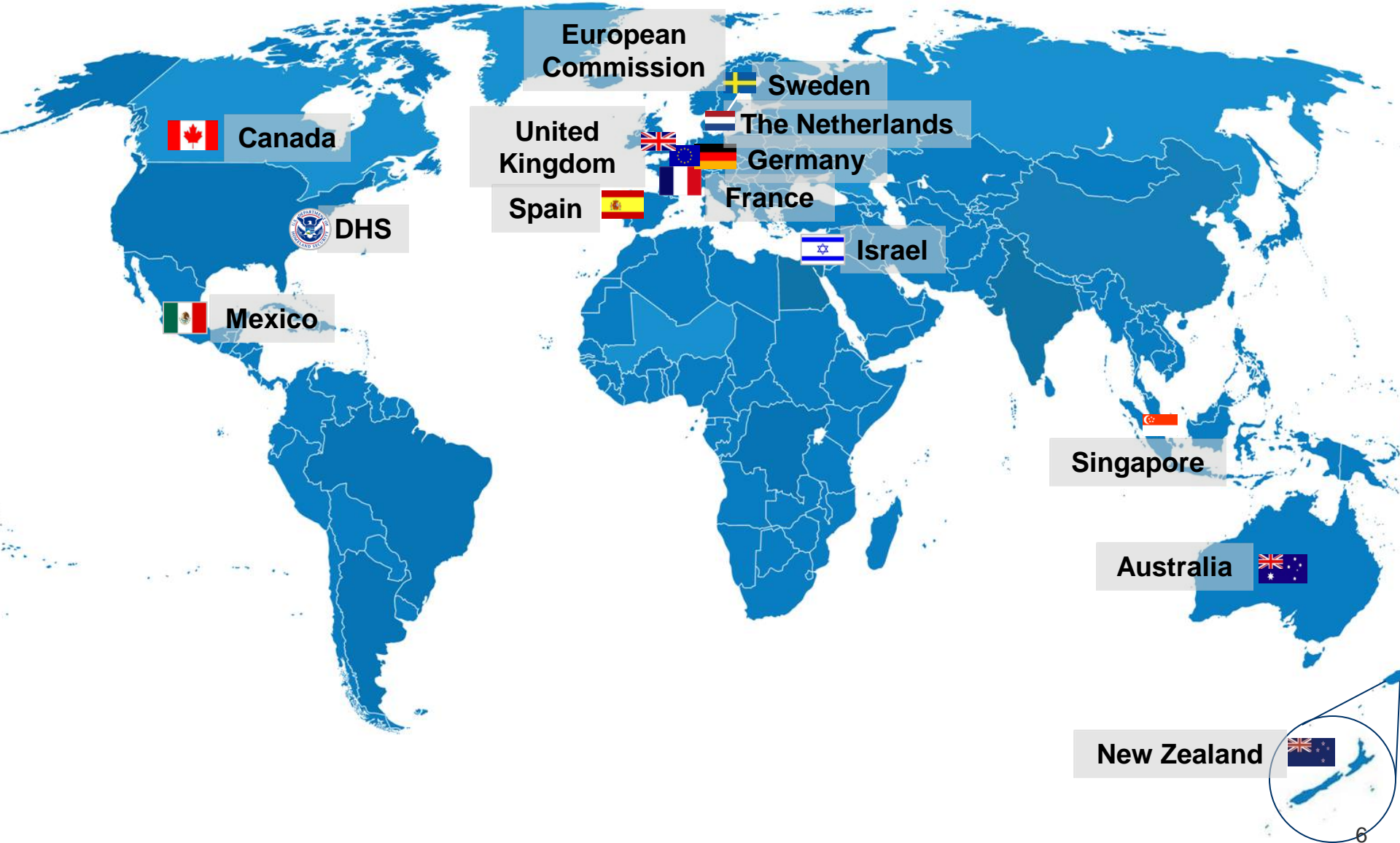
COE University Partnership Network



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International Agreements



Current Risks and Threats

- Counter UAV
- Counter Violent Extremism
- Aviation Security
- Space/Satellites
- Super Ports
- Cyber-Physical



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Advancing Risks and Threats

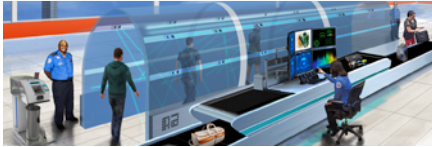
- 3-D Printing/
Additive
Manufacturing
- Agriculture
Security
- Synthetic
Biology
- Positioning,
Navigation, and
Timing



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Where We are Going: Visionary Goals



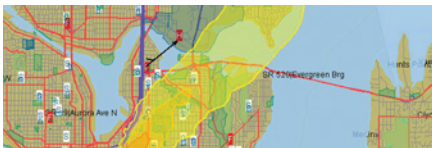
SCREENING AT SPEED:

Security that Matches the Pace of Life



A TRUSTED CYBER FUTURE:

Protecting Privacy, Commerce, and Community



ENABLE THE DECISION MAKER:

Actionable Information at the Speed of Thought



RESPONDER OF THE FUTURE:

Protected, Connected, and Fully Aware



RESILIENT COMMUNITIES:

Disaster-Proofing Society

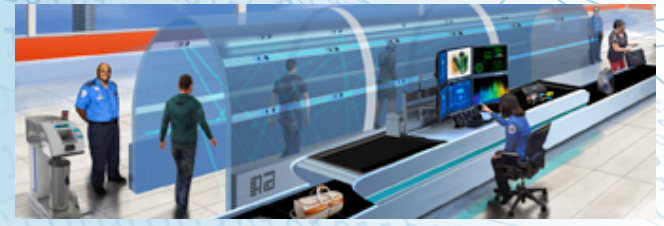


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SCREENING AT SPEED

Checkpoint of the Future



- Combine biometrics and detection technologies
- Automate x-ray target detection and identification
- Integrate imaging, trace detection, and other sensing technologies, and software systems



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A TRUSTED CYBER FUTURE

Next-Generation Cyber Infrastructure



- Focus on the challenges facing critical infrastructure sectors from targeted cyber attacks.
- Develop capabilities to:
 - Detect a cyber threat without relying on a known cyber signature
 - Understand how a threat will affect operations; and
 - Neutralize the threat in a manner that does not impact operations.
- Initial focus on financial services sector with plans to expand to other sectors in the future



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ENABLE THE DECISION MAKER

Borders, Customs and Immigration

Border Situational Awareness

- Use “big data” analytics to make better use of existing data sources
- Improve intruder detection and projected trajectories

Air Entry/Exit Re-Engineering

- Use biometrics to register arrivals and departures of foreign nationals

Border Enforcement Analytics

- Use “big data” analytics to detect and track illicit cargoes globally



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ENABLE THE DECISION MAKER

Real-Time Bio Threat Awareness



- Rapid DNA analysis (now less than 3 hours)
- Rapidly estimate:
 - Exposed population
 - Rates of infection
 - Response alternatives
- Employ interconnected networks for bio-surveillance



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RESPONDER OF THE FUTURE

Next Generation First Responder

- Develop scalable and modular ensemble that includes:
 - Enhanced duty uniform;
 - Personal protective equipment;
 - Wearable computing and sensing technology; and
 - Robust voice and data communication capabilities.
- With enhanced protection, communication, and situational awareness, responders can better safeguard lives and property before, during, and after a disaster



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RESILIENT COMMUNITIES

Flood Emergency Awareness

- Use “big data” analytics to rapidly assess federal role, funding
- Same for local and state emergency managers and responders
- Upgrade HAZUS to include tsunamis model from existing data

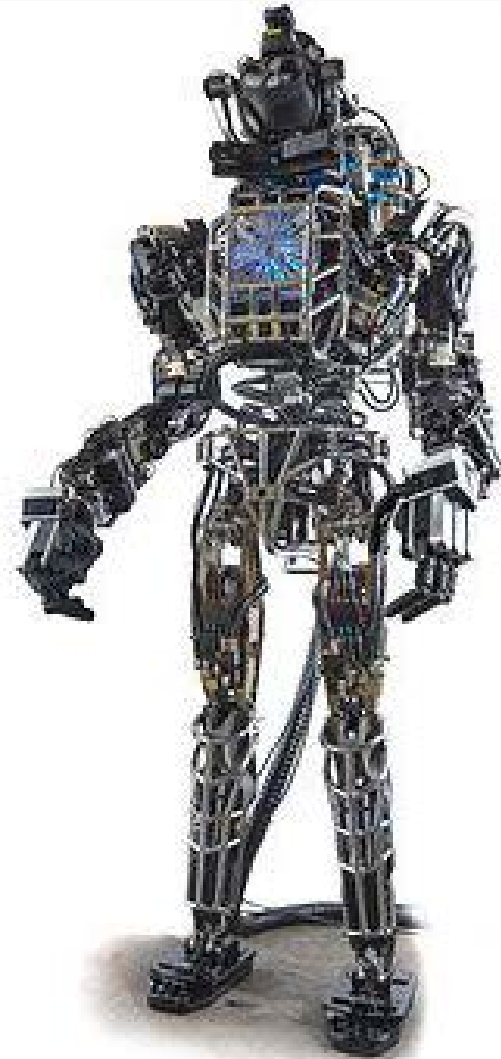


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The Future

- Application of Science to Combat Terrorism
- International Nature of Homeland Security
- Internet of Things/Wearables
- Big Data Analytics
- Robotics



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IPTs: Process

**Produces S1/S2-approved
Department-wide R&D Profile**

**Synchronizes R&D and
acquisition processes**

**Improves coordination with
external authorities (Congress,
OMB, etc.)**

**Leverages
operational
components,
technical experts,
and HQ leadership**

**Integrates and
collaborate on future
budgets**

**Led by individual
components and
coordinated by S&T**

**Provides technical
reviews of acquisition
programs**



**Transitions technology for
components to improve operations**



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Engage With Us



WEBSITE

scitech.dhs.gov
SBIR, LRBA



**NATIONAL
CONVERSATION**



**STAKEHOLDER
ENGAGEMENT**



SOCIAL MEDIA



**PRIZE
AUTHORITY**



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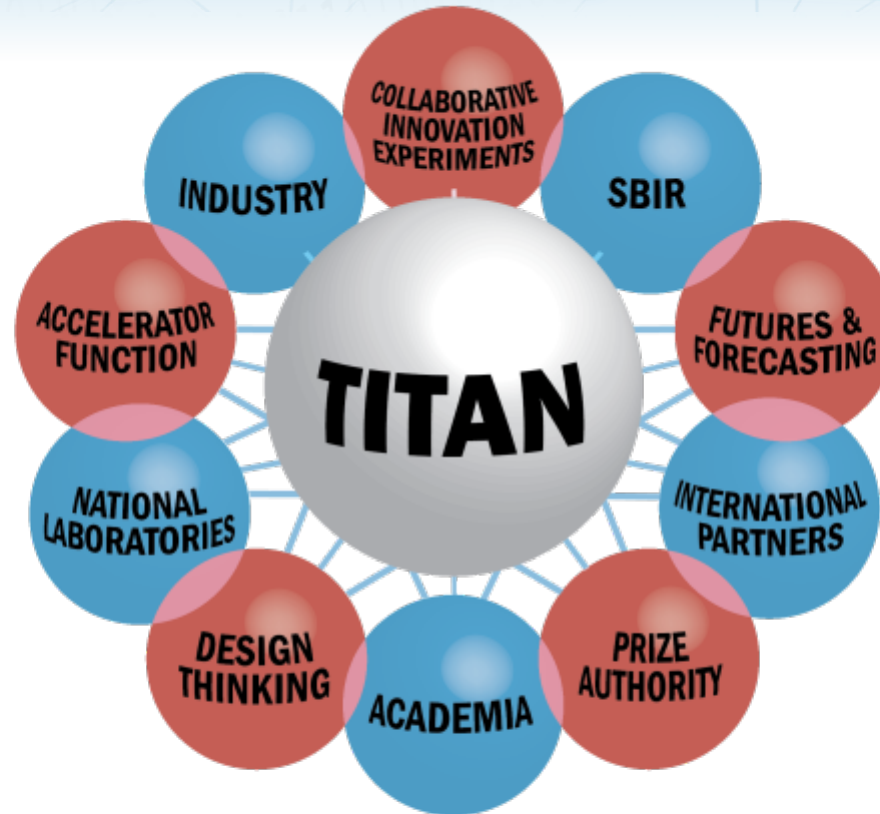


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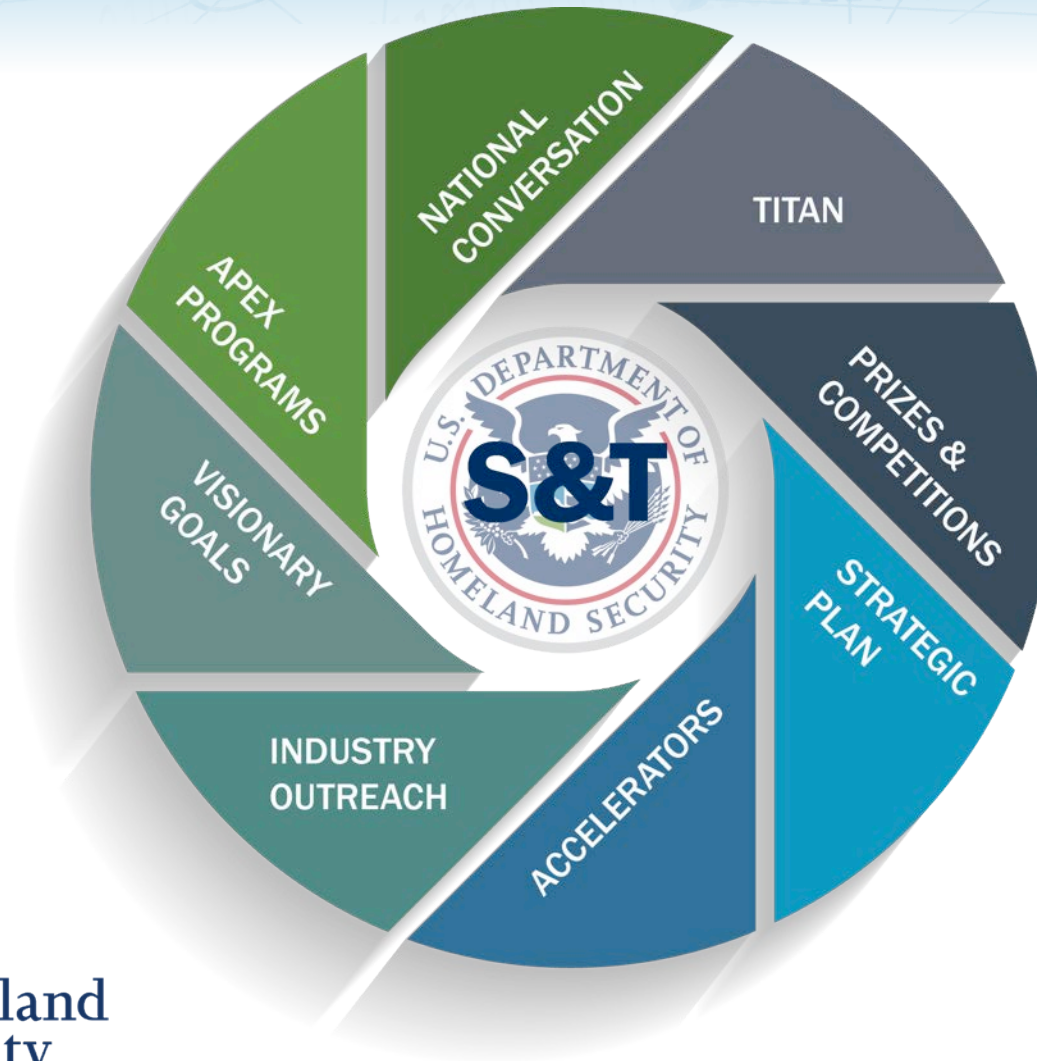
Back up slides

Reinventing Government R&D



**Targeted Innovative Technology
Acceleration Network**

Innovating at S&T



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S&T
**NATIONAL
CONVERSATION**

ON HOMELAND SECURITY TECHNOLOGY

**JOIN THE CONVERSATION.
BE THE FUTURE OF R&D.**

<http://scitech.ideascale.com/>

START TALKING

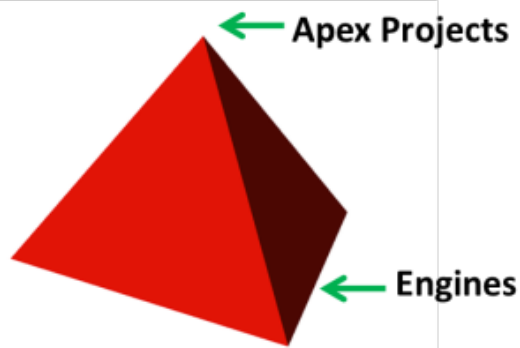
TODAY!



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Apex Programs and Engines



ENGINES PROVIDE FOUNDATIONAL SUPPORT TO JUMP-START OR INFORM ACTIVITIES WITHIN APEX PROJECTS.

Programs

	Border Situational Awareness		Next-Generation First Responder
	Real-Time Bio Threat Awareness		Next-Generation Cyber Infrastructure
	Checkpoint Screening at Speed		RAPID
	Air Entry/Exit Re-Engineering (AEER)		Border Enforcement Analytics Program (BEAP)

Engines

	Behavioral, Economic, and Social Science (BESS-E)		Communications and Networking (CN-E)
	Data Analytics (DA-E)		Identity and Access Management (IDAM-E)
	Model and Simulation (MS-E)		Situational Awareness and Decisional Support (SANDS-E)



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