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# Lincoln Laboratory

MIT Lincoln Laboratory is a Federally Funded Research and Development Center (FFRDC) operated by the Massachusetts Institute of Technology under contract with the Department of Defense (DOD). The Laboratory’s core competencies are in sensors, information extraction (signal processing and embedded computing), communications, integrated sensing, and decision support, all supported by a strong program in advanced electronics technology.

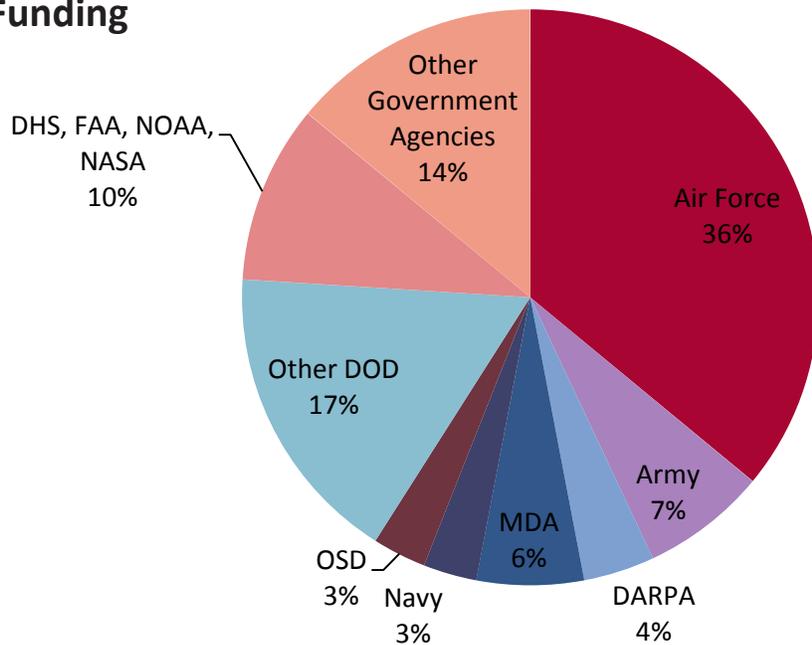
Since its establishment in 1951, MIT Lincoln Laboratory’s mission has been to apply technology to problems of national security. The Laboratory’s technology development is focused on its primary mission areas—space control; air and missile defense technology; communication systems and cyber security; intelligence, surveillance, and reconnaissance systems and technology; advanced electronics; tactical systems; and homeland protection. In addition, Lincoln Laboratory undertakes government-sponsored, nondefense projects in areas such as air traffic control and weather surveillance.

Two of the Laboratory’s principal technical objectives are (1) the development of components and systems for experiments, engineering measurements, and tests under field operating conditions and (2) the dissemination of information to the government, academia, and industry. Program activities extend from fundamental investigations through the design process, and finally to field demonstrations of prototype systems. Emphasis is placed on transitioning systems and technology to industry.

MIT Lincoln Laboratory also emphasizes meeting the government’s FFRDC goals of maintaining long-term competency, retaining high-quality staff, providing independent perspective on critical issues, sustaining strategic sponsor relationships, and developing technology for both long-term interests and short-term, high-priority needs.

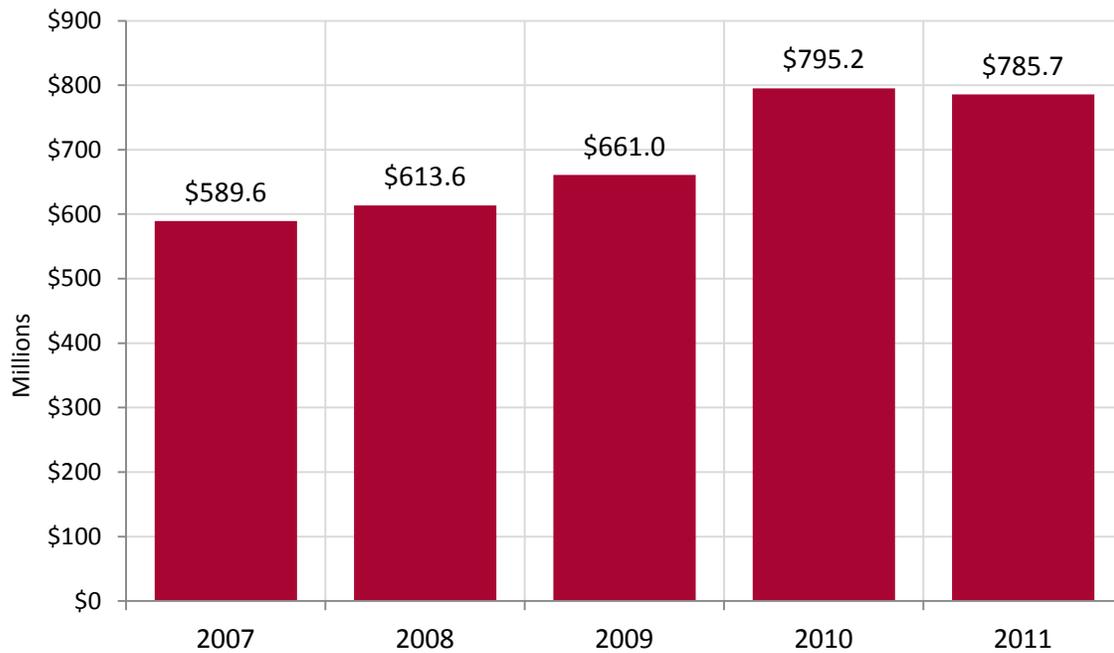
## FY 2011 Authorized Funding By Sponsor

Total Authorized FY 2011 Funding = \$870.0 M

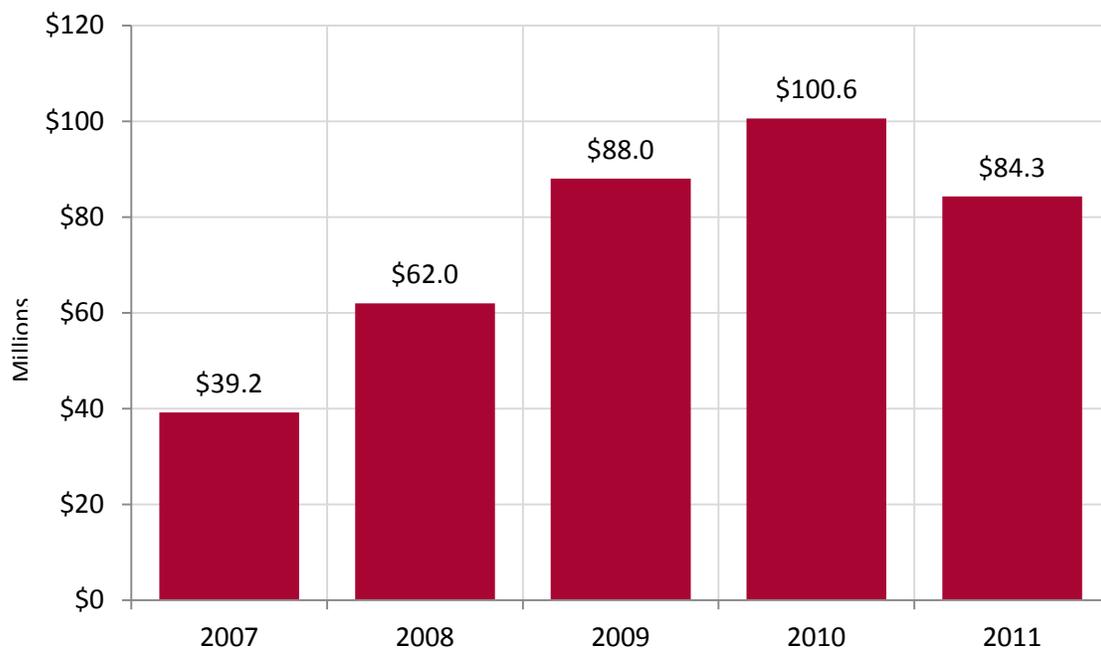


All data are for the period concurrent with the U.S. Government fiscal year, Oct. 1 to Sept. 30.

**Total DOD Authorized Funding  
FY07 to FY11**



**Non-DOD Programs  
FY07 to FY11**

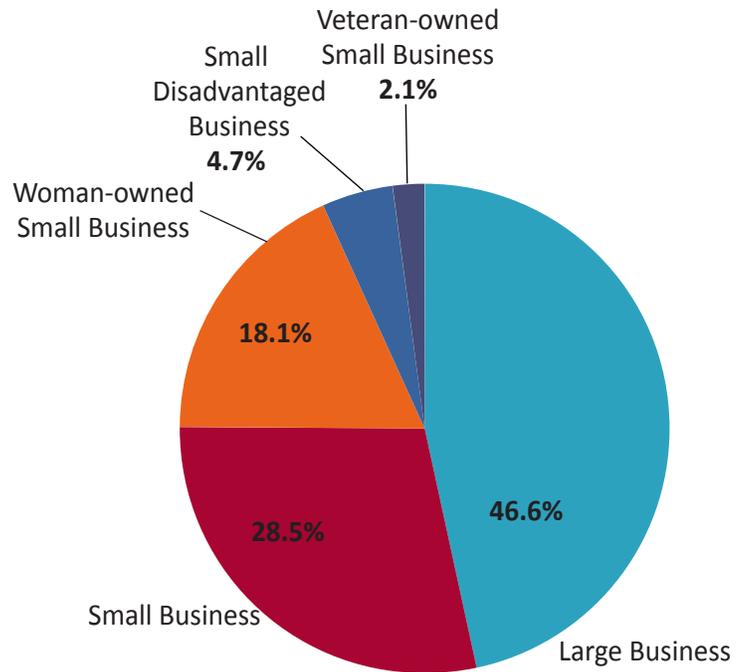


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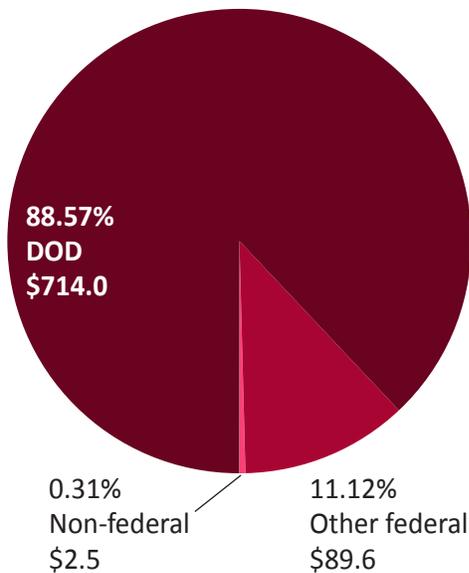
## Lincoln Laboratory's Economic Impact

Goods and Services (including subcontracts) Expenditures Fiscal Year 2011 (In \$millions)	
Type	Amount
Large Business	202.6
Small Business (SB)	123.9
Woman-owned SB	78.7
Small Disadvantaged Business	20.5
Veteran-owned SB	9.1
<b>Total</b>	<b>434.8</b>
<b>Top Seven States</b>	
Massachusetts	209.2
California	44.6
New Hampshire	26.4
Texas	19.5
New York	19.0
Virginia	11.2
Colorado	10.9
<b>Other New England States</b>	
Rhode Island	4.2
Connecticut	3.0
Vermont	0.2
Maine	0.04

Lincoln Laboratory has generated and supported a range of national business and industrial activities. These charts show the Laboratory's economic impact by business category and state. In FY11, the Lab issued subcontracts with a value that exceeded \$434 million; New England states are the primary beneficiaries of the outside procurement program.



All of the above data are for the period concurrent with the U.S. Government fiscal year, Oct. 1 to Sept. 30.



## Lincoln Laboratory's Research Expenditures

Lincoln Lab employs 1,670 technical staff, 392 technical support personnel, 1,067 support personnel, and 584 subcontractors.

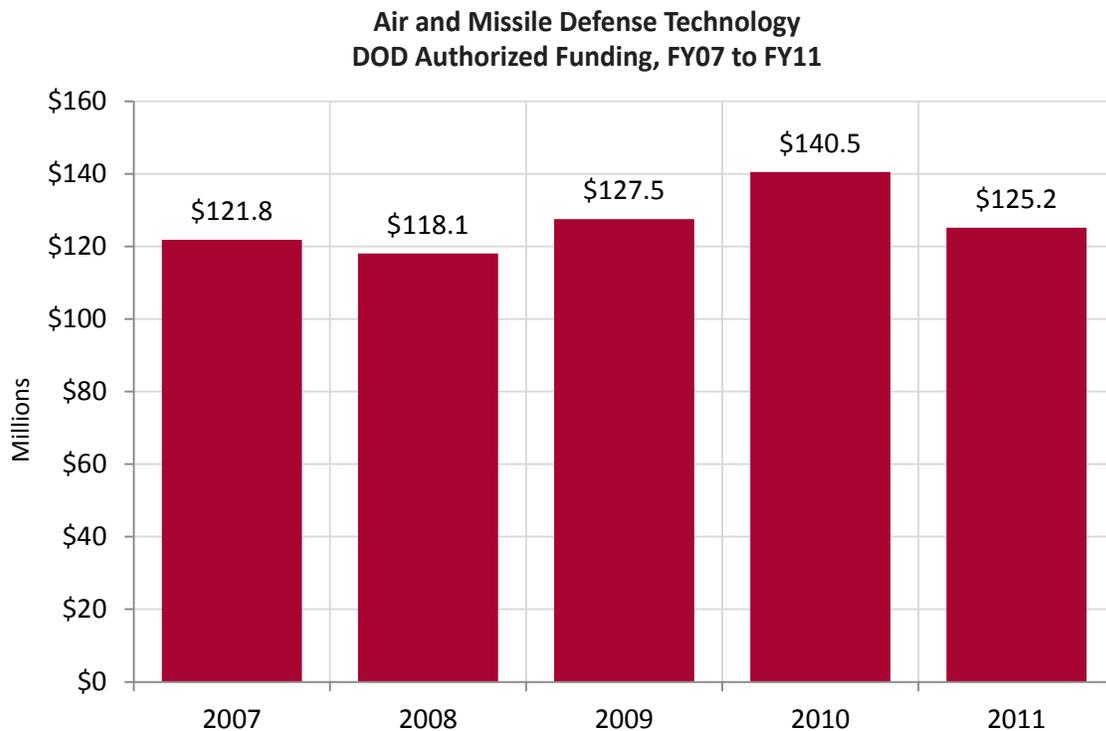
**Research Expenditures (in millions)**  
**Fiscal Year 2011\***  
**Total: \$806.1 million**

\*This graph shows research expenditures for the MIT fiscal year, which runs from July 1 to June 30. The data reported in this section reflect the period concurrent with the U.S. Government fiscal year, which runs from October 1 to September 30.

## Air and Missile Defense Technology

In the Air and Missile Defense Technology mission, Lincoln Laboratory works with government, industry, and other laboratories to develop integrated systems for defense against ballistic missiles, cruise missiles, and air vehicles in tactical, strategic, and homeland defense applications. Activities include the investigation of system architectures, development of advanced sensor and decision support technologies, development of flight-test hardware, extensive field measurements and data analysis, and the verification and assessment of deployed system capabilities.

The program includes a focused evaluation of the survivability of U.S. air vehicles against air defense systems. The mission strongly emphasizes the rapid prototyping of sensor and system concepts and algorithms, and the transfer of the resulting technologies to government contractors responsible for the development of operational systems.



*All data are for the period concurrent with the U.S. Government fiscal year, Oct. 1 to Sept. 30.*

## Communication Systems and Cyber Security

In Communication Systems and Cyber Security, the Laboratory works to enhance the capabilities of current and future U.S. global defense communications networks (space, air, land, and sea) in the transport and knowledge domains. The mission emphasizes developing architectures; identifying, prototyping, and demonstrating components, subsystems, and systems; and then transferring this technology to industry for use in operational systems.

Current efforts span all network layers (from physical to application), with primary focuses on satellite communications, aircraft and vehicle radios and antennas, tactical networking, language processing, net-centric operations, and cyber operations.

**Communication Systems and Cyber Security  
DOD Authorized Funding, FY07 to FY11**

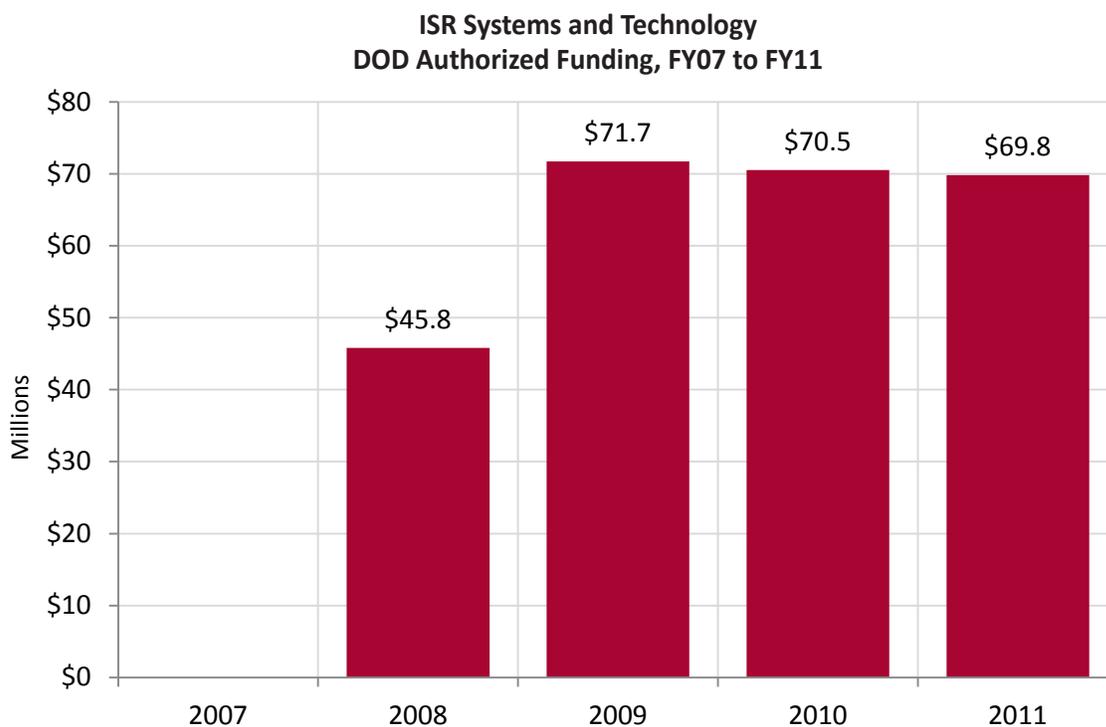


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## Intelligence, Surveillance, and Reconnaissance Systems and Technology

The Intelligence, Surveillance, and Reconnaissance (ISR) Systems and Technology mission conducts research and development into advanced sensing concepts, signal and image processing, high performance computing, networked sensor architectures, and decision sciences. This work focuses on providing improved surface and undersea surveillance capabilities for problems of national interest. The Laboratory's ISR program encompasses airborne imaging and moving target detection radar, radio frequency geolocation

systems, electro-optic imaging, and laser radar. For such systems, the Laboratory typically performs phenomenology analysis, system design, component technology development, and significant experimentation. Successful concepts often develop into experimental prototype ISR systems, sometimes on surrogate platforms, that demonstrate new capability in operationally relevant environments.



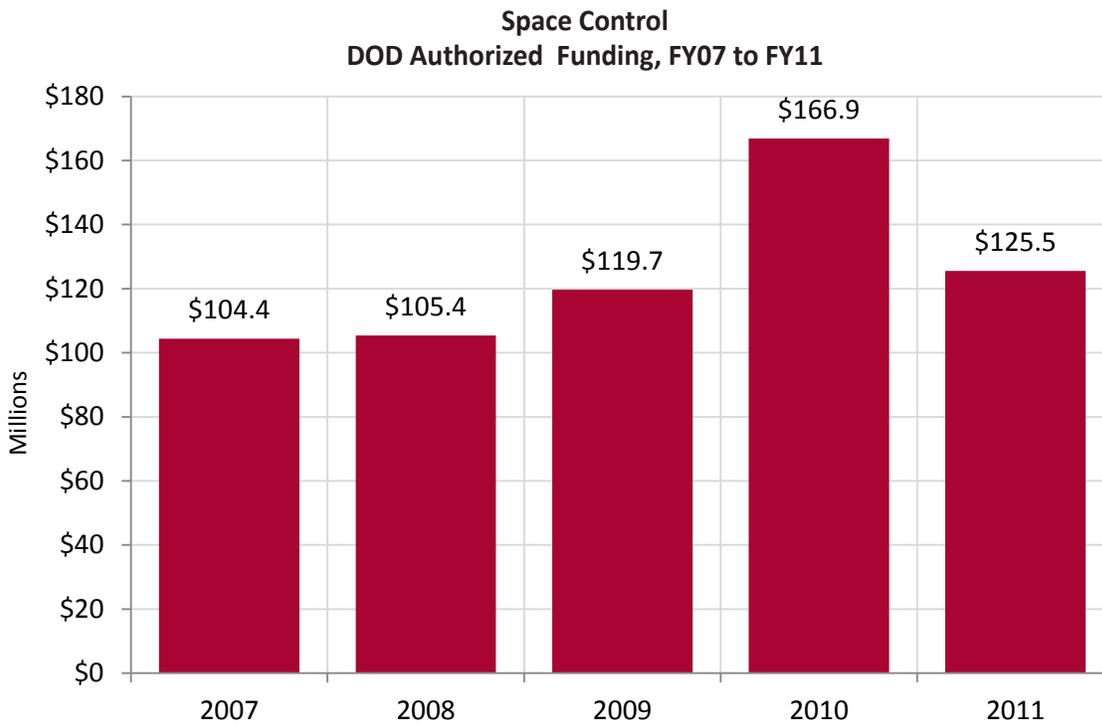
The ISR Systems and Technology mission area was instituted in 2008.

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## Space Control

The Space Control mission develops technology that enables the nation's space surveillance system to meet the challenges of space situational awareness. Lincoln Laboratory works with systems to detect, track, and identify man-made satellites; performs satellite mission and payload assessment; and investigates technology to improve monitoring of the space environment, including space weather and atmospheric and ionospheric effects.

The technology emphasis is the application of new components and algorithms to enable sensors with greatly enhanced capabilities and to support the development of net-centric processing systems for the nation's Space Surveillance Network.

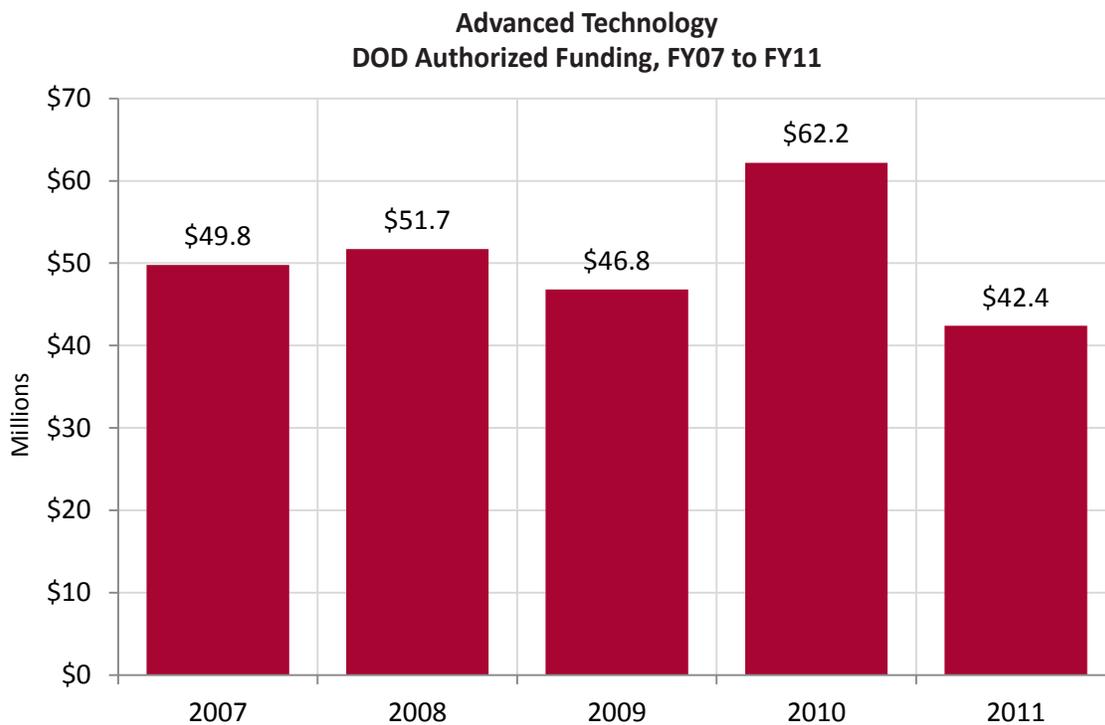


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## Advanced Technology

Research and development in the Advanced Technology mission focus on the invention of new devices, their practical realization, and their integration into subsystems. Although many devices continue to be based on solid-state electronic or electro-optical technologies, recent work is highly multidisciplinary, and current devices increasingly exploit biotechnology and innovative chemistry. The broad scope of work includes the development of unique high-performance detectors and focal planes, three-

dimensional integrated circuits, biological- and chemical-agent sensors, diode lasers and photonic devices using compound semiconductors and silicon-based technologies, microelectromechanical devices, radio-frequency components, unique lasers including high-power fiber and cryogenic lasers, and quantum logic in both superconducting and trapped-ion forms.

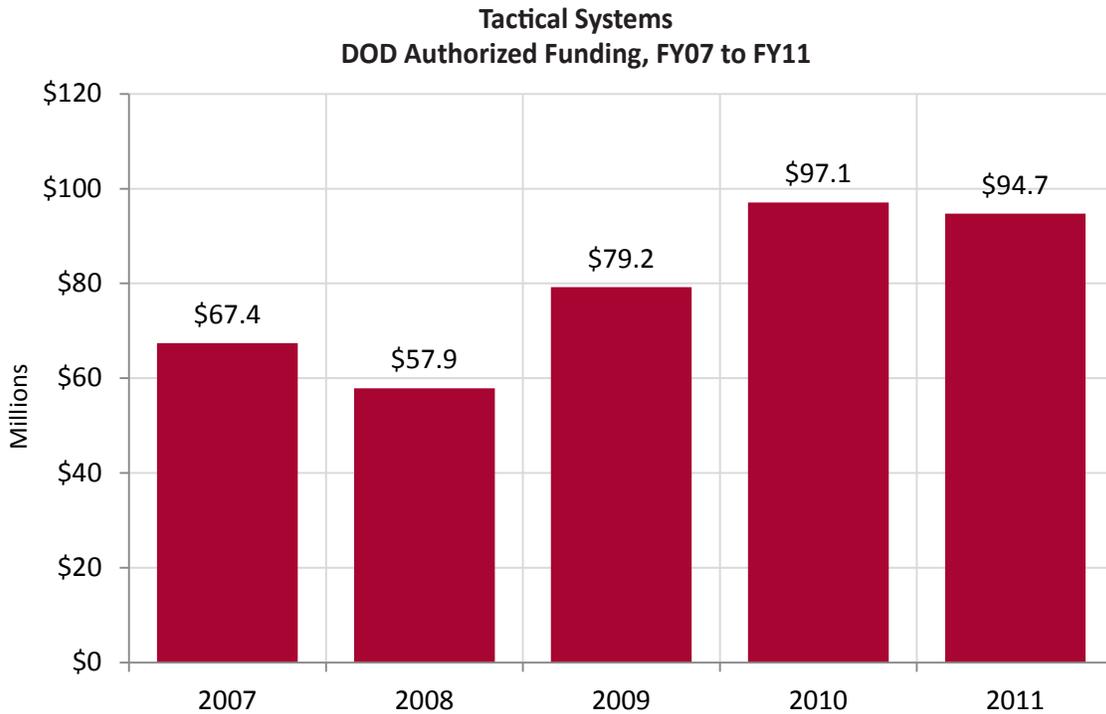


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## Tactical Systems

In the Tactical Systems mission, Lincoln Laboratory assists the Department of Defense in improving the acquisition and employment of various tactical air and counterterrorist systems by helping the U.S. military understand the operational utility and limitations of advanced technologies. Activities focus on a combination of systems analysis to assess technology impact in operationally relevant scenarios, rapid development and instrumentation of proto-

type U.S. and threat systems, and detailed, realistic, instrumented testing. A tight coupling between the Laboratory's efforts and the DOD sponsors and warfighters involved in these efforts ensures that these analyses and prototype systems are relevant and beneficial to the warfighter.

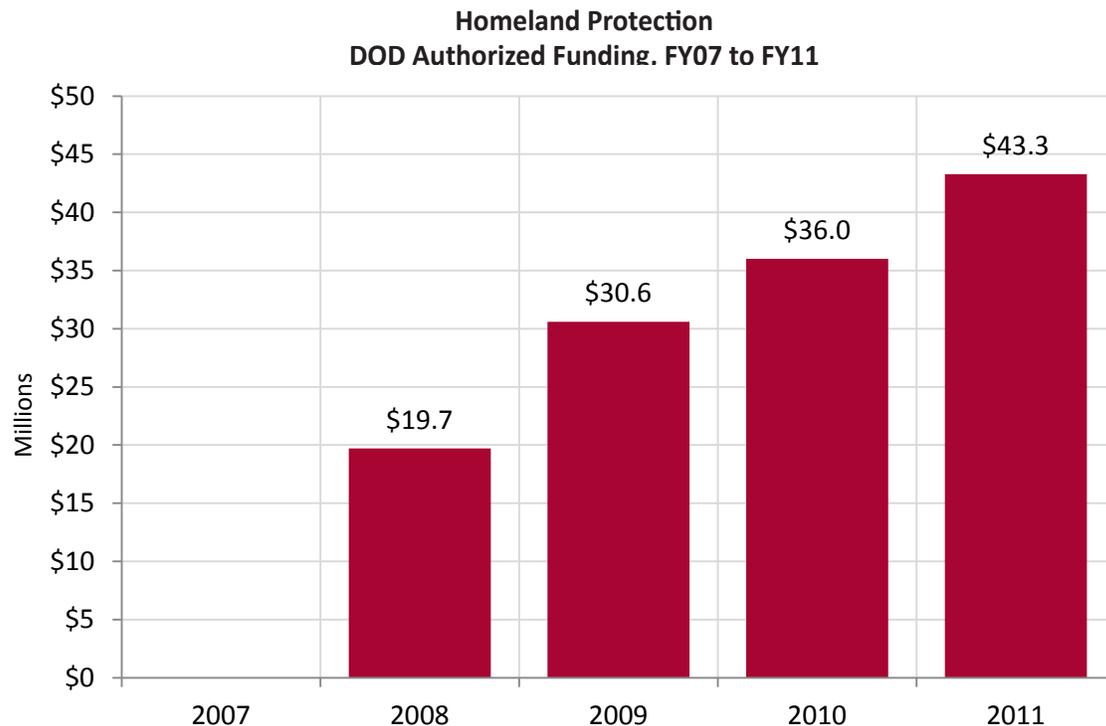


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## Homeland Protection

The Homeland Protection mission supports the nation's security by innovating technology and architectures to help prevent terrorist attacks within the United States, to reduce the vulnerability of the nation to terrorism, to minimize the damage from terrorist attacks, and to facilitate recovery from either man-made or natural disasters. The broad sponsorship for this mission area spans the Department of Defense (DOD), the Department of Homeland Security (DHS), and other federal, state, and local entities.

Recent efforts include architecture studies for the defense of civilians and facilities against biological attacks, development of the Enhanced Regional Situation Awareness system for the National Capital Region, the assessment of technologies for border and maritime security, and the development of architectures and systems for disaster response.



The Homeland Protection mission area was instituted in 2008.

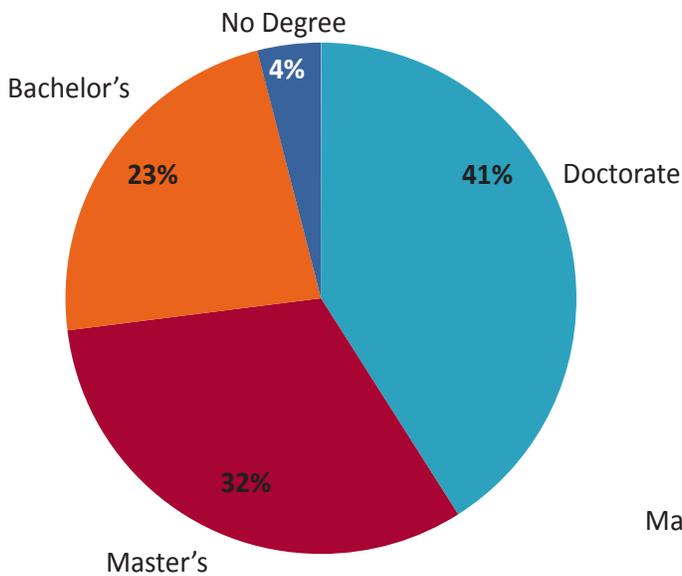
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## Lincoln Laboratory Staff

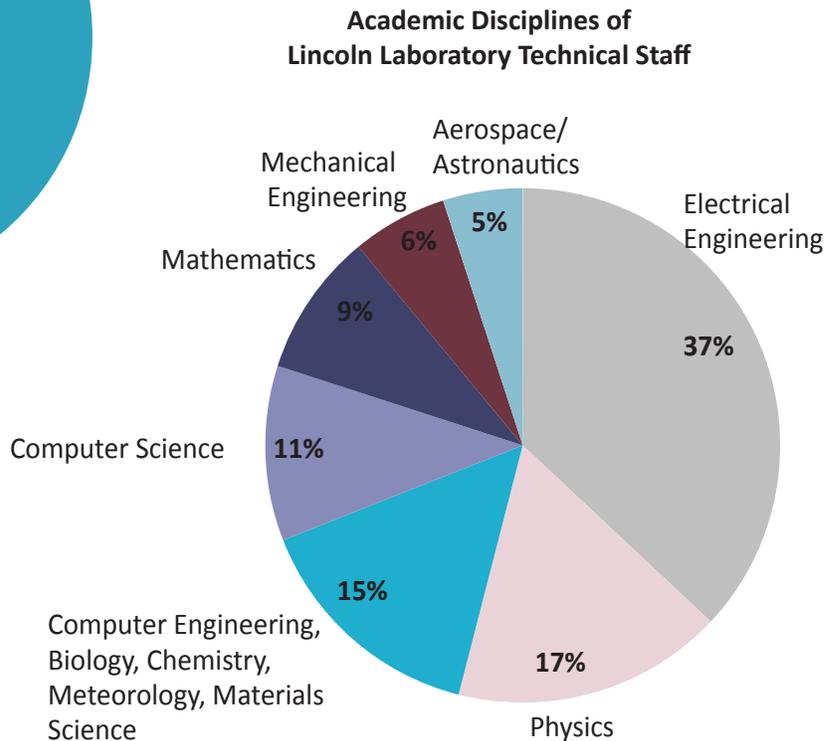
Approximately 1,700 professional technical staff are involved in research programs. Almost three-quarters of the technical staff have advanced degrees, with 41% holding doctorates. Professional development opportunities and challenging cross-disciplinary projects are responsible for the Laboratory's ability to retain highly qualified, creative staff. Lincoln Laboratory recruits at more than 60 of the

nation's top technical universities, with 65% to 75% of new hires coming directly from universities. Lincoln Laboratory augments its campus recruiting by developing long-term relationships with research faculty and promoting fellowship and summer internship programs.

### Technical Staff Profile



Degrees Held by Lincoln Laboratory Technical Staff



All data are for the period concurrent with the U.S. Government fiscal year, Oct. 1 to Sept. 30.

## Test Facilities and Field Sites

### Hanscom Field Flight and Antenna Test Facility

The Laboratory operates the main hangar on the Hanscom Air Force Base flight line. This 93,000-sq-ft building accommodates the Laboratory Flight Test Facility and complex of state-of-the-art antenna test chambers. The Flight Facility houses several Lincoln Laboratory-operated aircraft used for rapid prototyping of airborne sensors and communications.



Hanscom Field Flight and Antenna Test Facility

### Millstone Hill Field Site, Westford, MA

MIT operates radio astronomy and atmospheric research facilities at Millstone Hill, an MIT-owned, 1,100-acre research facility in Westford, Massachusetts. Lincoln Laboratory occupies a subset of the facilities whose primary activities involve tracking and identification of space objects.



Millstone Hill Field Site, Westford, Massachusetts

### Reagan Test Site, Kwajalein, Marshall Islands

Lincoln Laboratory serves as the scientific advisor to the Reagan Test Site at the U.S. Army Kwajalein Atoll installation located about 2,500 miles WSW of Hawaii. Twenty staff members work at this site, serving two- to three-year tours of duty. The site's radars and optical and telemetry sensors support ballistic missile defense testing and space surveillance. The radar systems provide test facilities for radar technology development and for the development of ballistic missile defense techniques.



Reagan Test Site, Kwajalein Atoll, Marshall Islands

### Other Sites

Pacific Missile Range Facility, Kauai, Hawaii  
Experimental Test Site, Socorro, New Mexico

