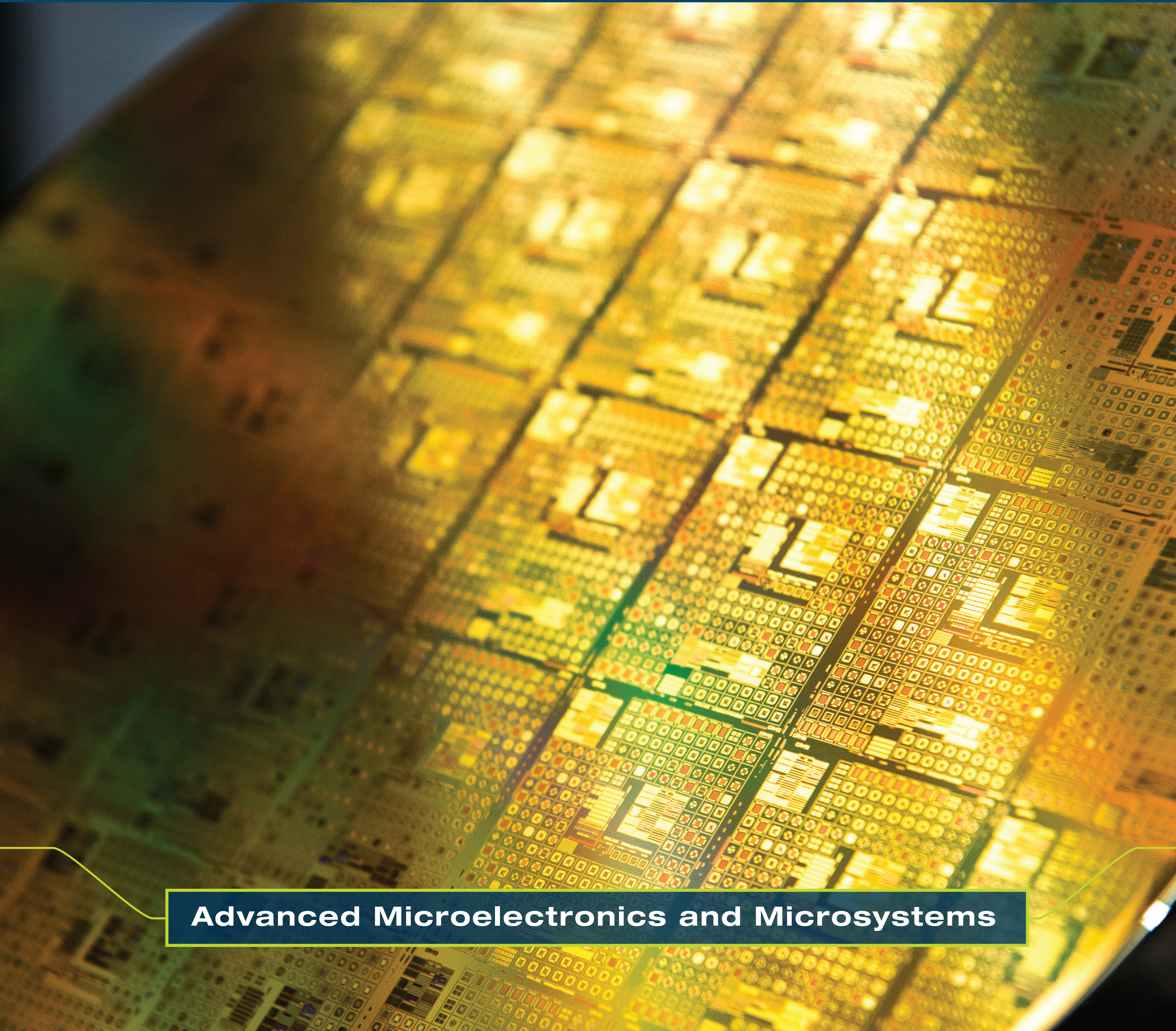
SIGNALS

MIT LINCOLN LABORATORY

capabilities series



Advanced Microelectronics and Microsystems

Research and development in **ADVANCED ELECTRONICS TECHNOLOGY** creates new device concepts, develops their realization, and integrates them into subsystems. While many advanced electronics devices continue to be based on solid-state or electro-optical technologies, recent work is highly multidisciplinary, and current devices increasingly exploit biotechnology and innovative chemistry.

The broad scope and capability of Lincoln Laboratory's advanced electronics work includes development of unique high-performance detectors and focal planes, superconducting and 3D integrated circuits, chemical-agent sensors, diode lasers and photonic devices using compound semiconductors and silicon-based technologies, microelectromechanical devices, RF technology, and unique lasers including high-power fiber and cryogenic lasers.

Capabilities

- Fabrication of gigapixel charge-coupled device (CCD) imager focal planes
- Visible through infrared photon-counting avalanche photodiode (APD) array fabrication
- Fully depleted 90-nm silicon-on-insulator CMOS technology for imaging, RF, and harsh-environment electronics
- Fabrication of niobium-based superconducting circuits
- Development of photonic devices, including photonic integrated circuits, microchip lasers, and detectors, from materials growth through fabrication and test
- Heterogeneous integration utilizing 3D wafer and chip bonding as well as multichip module technology
- Fabrication of GaN-on-silicon high-electron-mobility transistors and circuits
- Development of RF and optical microelectromechanical systems

Applications

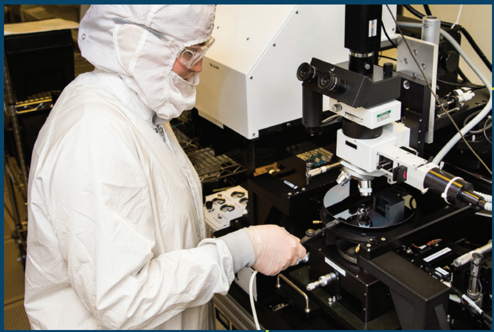
- Cryogenic and energy efficient supercomputing systems
- Ground-based and space-based imaging using large-format CCD focal plane arrays
- Smart mid-wave and long-wave infrared imaging using advanced digital focal-plane array readout technology
- 3D and low-light photon-counting imaging using Geiger-mode APD focal plane arrays
- Compact and low cost radar systems
- Optical communications and inertial sensing
- Chemical and biological detectors using advanced microchip laser technology
- Man-portable and long-endurance unattended sensing using small-form-factor, low-power electronics

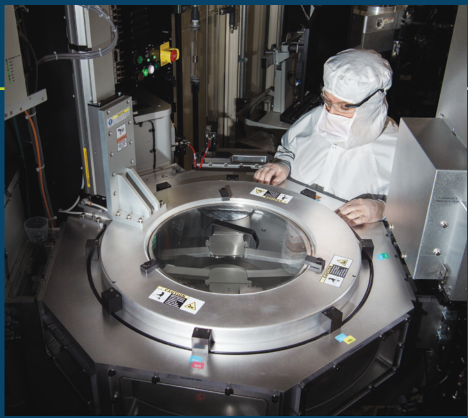
Benefits

- Lincoln Laboratory's advanced electronics R&D targets component and subsystem-level technologies that enable new approaches to Department of Defense systems and that advance the state of the art for U.S. industry. The goal is to understand DoD systems and develop technologies "that will make a difference."
- Our laboratory accomplishes this goal by employing its expertise in a wide range of fields: biology, chemistry, computer science, device physics, integrated circuit design and fabrication, lithography, materials, nanofabrication, optics, optoelectronics, packaging, photonics, quantum information systems, and RF technology.

Facilities

- DMEA Trusted Category 1A supplier for design, fabrication (foundry), and packaging of custom integrated circuits
- Microelectronics Laboratory, a 90-nm class semiconductor research and advanced prototyping facility, operating 24 hours a day, 5 days a week to support sub-10-nm device research and advanced fabrication of integrated circuits and space-qualified focal planes
- Compound semiconductor laboratories include materials growth, materials characterization, and cleanroom fabrication facilities
- Advanced packaging facilities enabling flip-chip bump-bonding, high-speed wire-bonding, precision multichip module integration, and optical fiber welding
- Optical grinding and coating facilities
- A computer-aided design (CAD) infrastructure featuring a full suite of technical process and device, integrated circuit, and printed circuit CAD tools
- Electronic test facilities include high-speed digital, analog, and mixed-signal circuit characterization; cryogenic, high-temperature, and radiation test capabilities; RF and millimeter-wave testing; advanced focal plane and optical test and characterization facilities





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CERTIFICATE

The Certification Body of
TÜV SÜD AMERICA INC.

hereby certifies that

MIT Lincoln Laboratory
244 Wood Street
Lexington, MA 02420 USA

has implemented a Quality Management System
in accordance with:

ISO 9001:2008

The scope of this Quality Management System includes:

The Microelectronics Laboratory of
MIT Lincoln Laboratory, providing
Wafer Fabrication Services

Certificate Expiry Date: July 19, 2018

Certificate Registration No: 951 15 7049

Effective Date: July 20, 2015

Gary W. Minks
VP, Regulatory Affairs

ANAB ACCREDITED
MANAGEMENT SYSTEMS CERTIFICATION BODY

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UCB_F_12.03 2012-02

ACCREDITATION OF TRUST

Microelectronics Trusted Source
CATEGORY 1A

By these presents the undersigned expresses the confidence of the Department of Defense, Defense Microelectronics Activity (DMEA) in the ability of the organization known as

Lincoln Laboratory
Massachusetts Institute of Technology

to deliver trusted foundry microelectronic goods and services to end users within the United States Government that correspond to Trusted Category 1A which meets Mission Assurance Category 1 as defined by Instruction 8500.2 of the Department of Defense Directives, effective this date.

302	3G050	27 Nov 2016	27 Nov 2018	
Site Accreditation Number	Cage Code	Effective Date	Renewal Date	Ted Glum Director, Defense Microelectronics Activity

LINCOLN LABORATORY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

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