

SHAPING THE FUTURE OF MICROELECTRONICS

The Scalable Asymmetric Lifecycle Engagement (SCALE) network is the preeminent U.S. program for semiconductor workforce development in the defense sector.



1,000+
STUDENTS
ENROLLED

33
LEADING
UNIVERSITIES

140
FACULTY AND
STAFF

\$65M
IN DOD
FUNDING

There is a global need for microelectronics that are safe and reliable. However, several factors challenge the design and manufacture of microchips, including disruptions in the production chain and an urgent need to rapidly expand the skilled microelectronics workforce.

Led by Purdue University, funded by the Defense Department and managed by NSWC Crane, SCALE promotes a different approach to training highly skilled U.S. microelectronics engineers, hardware designers and manufacturing experts. SCALE brings together a public-private-academic partnership of 33 universities and 56 partners within the

defense industry and government. The industry and government partners regularly meet and update a list of knowledge, skills and abilities important for new entrants to the workforce. The universities then update their curriculum to ensure the students are prepared for upcoming needs in the rapidly advancing microelectronics field.

KEY TECHNOLOGY FOCUS AREAS

- AI Hardware
- Commercial Leap Ahead
- Compound Semi
- Heterogeneous Integration and Advanced Packaging
- Radiation-Hardening
- System-on-Chip
- Trusted Artificial Intelligence



Purdue undergraduate engineer Hannah Pike and SCALE Director Peter Bermel perform infrared measurements on microelectronics to measure their durability. (Charles Jischke)

UNPARALLELED TRAINING OPPORTUNITIES

Since 2023, the Defense Department has granted SCALE millions in funds, with the current contract extending through 2027. With this, SCALE goals include:

- Growing to more than 2,000 students, 100 industrial partners and 40 universities
- Achieving sustainable K-12 classroom engagements across the United States
- Expanding microelectronics curriculum within community colleges and directly to practicing professionals via continuing education offerings

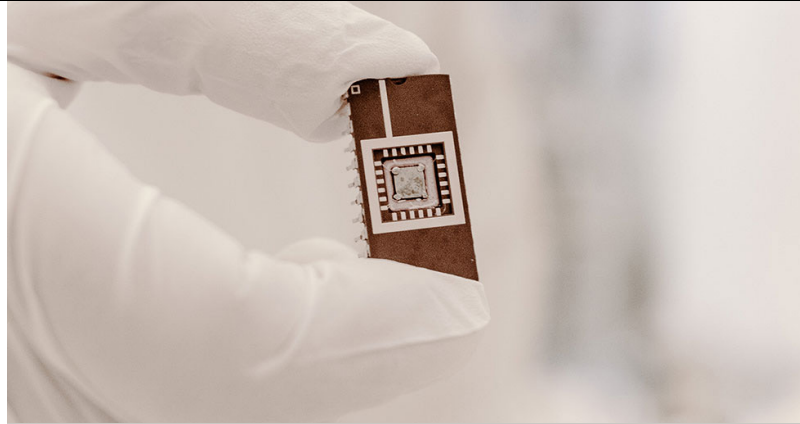
SCALE-enrolled undergraduate and graduate students get mentoring, training and hands-on experience through internships and research opportunities at the companies, universities and federal research organizations in the network.

JOB PLACEMENT

SCALE develops students toward an accelerated start in the field of defense microelectronics compared to peers. Student-employer matching of internship and post-graduate opportunities for first-year engineering through doctoral students is enabled through a SCALE specific job board, a unique SCALE web app with student directories and profiles and mentoring on job search strategies and career development planning.



SCALE Program Director, Professor Kerrie Douglas (right), and Adrian Nat Gentry, both from the Purdue University School of Engineering Education, discuss their research on how environmental and educational supports can better prepare students for careers in microelectronics. (Charles Jischke)



SCALE PARTNERS AS OF FEBRUARY 2025

Government Partners

Air Force
Air Force Life Cycle Management Center
Air Force Material Command
Air Force Nuclear Weapons Command
Air Force Research Lab-Space Vehicles Directorate
Army Combat Capabilities Development Command
Cornerstone OTA
Energy Department, National Nuclear Security Administration
Missile Defense Agency
National Aeronautics and Space Administration
National Security Agency
Naval Research Laboratories
Naval Surface Warfare Center, Crane Division
Navy Strategic Systems Program
Office of the Secretary of Defense for Research and Engineering, Trusted & Assured Microelectronics Program
Pacific Northwest National Laboratory
Sandia National Laboratories
Space Systems Command
White Sands Missile Range

Industry Partners

Aerospace Corporation
Amentum
Analog Devices
Applied Materials
BAE Systems
BCS Allegient
Blue Origin
Boeing Company
Cactus Materials
Calumet Electronics

Collins Aerospace
Draper Laboratories
GE Aerospace Research Center
General Dynamics
Global Foundries
Frontgrade Technologies
Honeywell
IBM
Innovative Scientific Solutions Inc.
Integra Technologies
Intel
In-Q-Tel
Johns Hopkins Applied Physics Laboratory
KBR
Keysight
L3Harris Corporation
Mercury Systems
Micross Components
Milanowski & Associates
MIT Lincoln Labs
MITRE
Northrop Grumman Corporation
Polar Semiconductor
Purdue Applied Research Institute
Qorvo
Qualcomm
Reliable Microsystems
Renesas Electronics
Science Systems and Applications Inc.
Siemens
Silicon Technologies
SK Hynix
SkyWater
Synopsys
Taiwan Semiconductor Manufacturing Company
Trusted Semiconductor Solutions
Western Digital