GROWING TOMORROW'S MICROELECTRONICS WORKFORCE

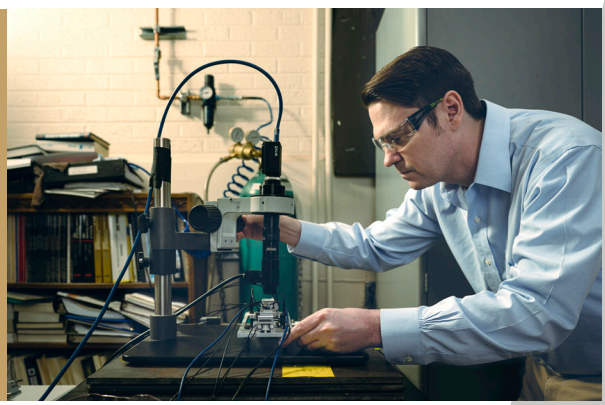
The Scalable Asymmetric Lifecycle Engagement (SCALE) network is the preeminent U.S. program for semiconductor workforce development in the defense sector.

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

Led by Purdue, funded by the DOD 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 22 universities and 48 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

- Radiation-Hardening
- Heterogeneous Integration
- System-on-Chip
- Embedded Systems/AI
- Supply-Chain Awareness
- Radio Frequency/Optical Electronics



David Halbrooks tests advanced packaging techniques. (Purdue University/Charles Jischke)

500+
STUDENTS ENROLLED

22
LEADING UNIVERSITIES

78
FACULTY AND STAFF

$42
MILLION IN DOD FUNDING

PURDUE UNIVERSITY

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

UNPARALLELED TRAINING OPPORTUNITIES

As of mid-2023, the Department of Defense granted SCALE four more years and $20 million more in funds, possibly exceeding $100 million. With this, SCALE goals for the next five years include:

- Growing to over 1,000 students, 100 industrial partners, and 25 universities.
- Achieving sustainable K-12 classroom engagements across the U.S.
- Expanding microelectronics curriculum within community colleges and directly to practicing professionals via continuing education offerings.

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

JOB PLACEMENT

SCALE's partnership assists students and employers in finding suitable matches for specialists in each area of SCALE, ranging from internships for first-year undergraduates to Ph.D. job placements.

Kerrie Douglas 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. (Purdue University/Charles Jischke)

SCALE PARTNERS

(as of September 2023)

GOVERNMENT PARTNERS

Aerospace Corporation
Air Force Life Cycle Management Center (AFLCMC)
Air Force Material Command (AFMC)
Air Force Nuclear Weapons Command (AFNWC)
Air Force Research Lab-Sensors Directorate (AFRL/RY)
Air Force Research Lab-Space Vehicles Directorate (AFRL/RV)
Department of Energy National Nuclear Security Administration (DOE/NNSA)
Jet Propulsion Laboratory
Missile Defense Agency (MDA)
National Aeronautics and Space Administration (NASA)-Goddard
Naval Research Laboratories
Naval Surface Warfare Center (NSWC)-Crane
Office of the Secretary of Defense for Research and Engineering-Trusted & Assured Microelectronics Program
Sandia National Laboratories
Space Systems Command (SSC)
Strategic Systems Program (SSP)
U.S. Army Combat Capabilities Development Command (DEVCOM)-Chemical Biological Center
White Sands Missile Range (SVAD)

INDUSTRY PARTNERS

Amentum
Analog Devices
Applied Materials
BAE Systems
Blue Origin
Boeing Corporation
Cobham Advanced Electronic Solutions (CAES)
Calumet Electronics
Draper Laboratories
General Dynamics Mission Systems
Global Foundaries
IBM
Innovative Scientific Solutions Inc. (ISSI)
Integra Technologies
Intel
InQTel
KBR-Centauri
Keysight
L3Harris Corporation
Mercury Systems
Milanowski & Assoc.
MIT Lincoln Labs
Northrop Grumman Corporation
Reliable Microsystems
Renesas Electronics
Science Systems and Applications Incorporated (SSAI)
SkyWater
Taiwan Semiconductor Manufacturing Company (TSMC)
Trusted Semiconductor Solutions
Western Digital

PURDUE UNIVERSITY