

# 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 17 universities and 34 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/Al
- Supply-Chain Awareness



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

**2004** Students Enrolled

17 LEADING UNIVERSITIES

> 67 FACULTY AND STAFF

SCO MILLION IN DOD FUNDING





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**

The Defense Department recently granted SCALE five more years and nearly \$11 million more in funds, possibly capping at nearly \$100 million. With this, the SCALE goals for the next five years include:

- Expanding student participation fivefold to more than 1,000.
- Developing learning models for K-12 classrooms.
- Collaborating with community colleges nationwide to develop microelectronics classes.

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 June 2022)

#### **GOVERNMENT PARTNERS**

Aerospace Corporation Air Force Life Cycle Management Center (AFLCMC) Air Force Nuclear Weapons Command (AFNWC) Air Force Research Lab-Sensors Directorate (AFRL/RY) Air Force Research Lab-Space Vehicles Directorate (AFRL/RV) Defense Microelectronics Activity (DMEA) 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 Force Space Systems Command (SSC) Strategic Systems Program (SSP) US Army Combat Capabilities Development Command (DEVCOM)-Chemical Biological Center White Sands Missile Range (SVAD)

#### **INDUSTRY PARTNERS**

**Boeing Corporation** Cobham Advanced Electronic Solutions (CAES) **Calumet Electronics Cornerstone OTA Draper Laboratories General Dynamics Mission Systems** Innovative Scientific Solutions Inc. (ISSI) **KBR-Centauri** L3Harris Corporation Mercury Systems Milanowski & Assoc. Northrop Grumman Corporation **Reliable Microsystems Renesas Electronics** Science Systems and Applications Incorporated (SSAI) Taiwan Semiconductor Manufacturing Company (TSMC) **Trusted Semiconductor Solutions** 

