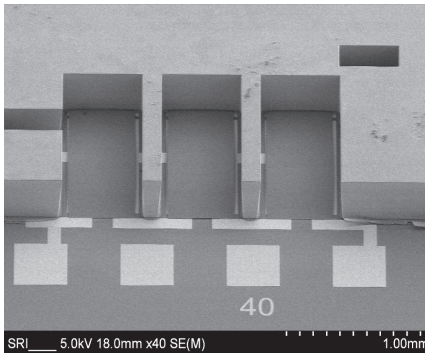


MicroScience Engineering Laboratory

SRI International's MicroScience Engineering Laboratory (MSEL) explores the fields of microelectromechanical systems (MEMS) and materials science to develop innovative micro- and nanometer-scale structures and sensors with real-world applications.

The laboratory provides research and development services in MEMS design, fabrication, and characterization for government and commercial clients. Technologies are developed in class-1,000 clean-room facilities using comprehensive analytical tools and testing capabilities.

The multidisciplinary MSEL team of research engineers, scientists, and technicians offers a wealth of expertise in practical design, fabrication, and characterization.



SEM of arrayed MEMS circuit breakers for power management applications

The MSEL team offers a wealth of expertise in MEMS practical design, fabrication, and characterization.

Technologies

Sensors for Harsh Environments

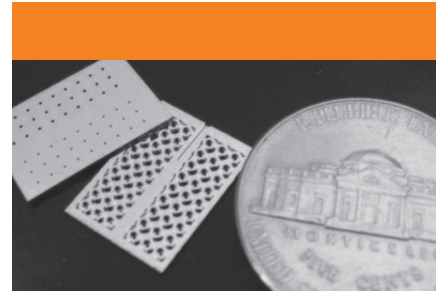
- Oceanographic ecosystems
- Space: pico and small satellites
- Biomedical sensors
- Integrated weather sensor, featuring temperature, relative humidity, wind speed, barometric pressure, and light intensity—all sensed on a single chip

Optical Microelectronics

- Optomechanical sensor readout
- Imaging and spectrometric detection
- Data communications

Advanced Materials for Microelectronics

- Wide-band-gap materials
- Surface acoustic wave devices
- Packaging
- Power MEMS
- Microinverters for solar energy
- MEMS voltage converters
- Reserve-type micro-batteries



Vacuum Microelectronics

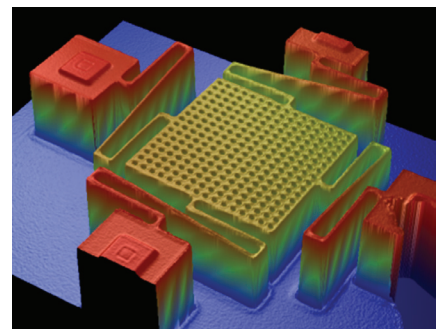
- Pulsed-power devices
- Cathodes for spacecraft
- X-ray sources and detectors
- Microthrusters for satellites
- Compact ion sources

New Measurement Tools

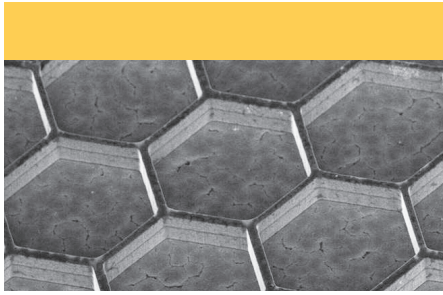
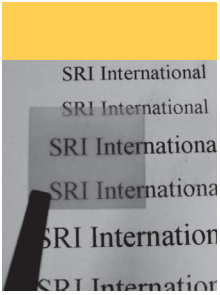
- Acoustic transducer arrays
- Micro-cylindrical ion trap (CIT) arrays for miniaturized mass spectrometer development

Optical MEMS

- Visible imaging of nonvisible scene information
- Corner cube retroreflector for optical data communications
- MEMS mirror arrays
- Optical grating sensor and accelerometer
- Direct optical sensor readout



Topography using white light interferometry to quantify MEMS structure and motion

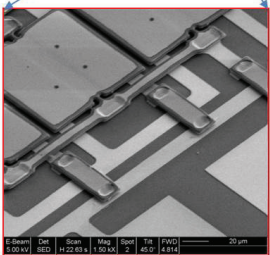
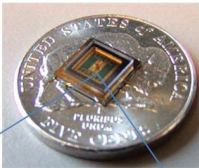


Left: Polished microcrystalline free-standing diamond. Right: Honeycomb array fabricated in diamond film.

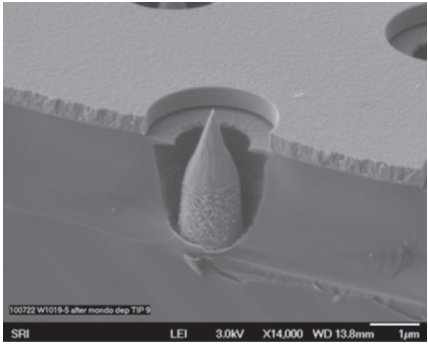


Novel Materials

- Diamond
- Graphene
- Nanocomposites
- Lanthanum strontium manganate
- Aluminum oxide
- Aluminum nitride
- Gallium nitride
- Zinc oxide



Corner cube retroreflector



Advanced Spindt cathode architecture for vacuum microelectronics

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Facilities

The laboratory operates two 5,000-square-foot MEMS fabrication facilities: one in Largo, Florida, and one in Menlo Park, California. The laboratory also offers more than 13,000 square feet of engineering space to support design, modeling, processing, packaging, analysis, and testing.