MASH

Mid-Atlantic SEMICONDUCTOR

HUB

Partnering for a Strong American Semiconductor Future

MASH Mission & Scope

MISSION & SCOPE

MASH will support the CHIPS and Science Act to enhance America's strength in semiconductors and microelectronics and promote economic development.

The goal of MASH is to create the world's largest nanofabrication, packaging, and characterization facility by linking and enhancing the facilities in the region. The MASH "distributed" network of facilities will support technology transition to manufacturing and offer redundancy of resources and immediate access to a huge amount of technical expertise in semiconductors.

MASH will focus on helping the semiconductor industry to transition materials into systems, which is a critical industrial need of many emerging applications such as advanced communications, non-volatile memory, More than Moore devices, Industrial Internet of Things, artificial intelligence, edge computing, wireless communications, quantum devices, environmental sustainability, and materials and substrates.

MASH activities will center around three cross-cutting areas: Si-adjacent technologies, advanced packaging, and virtualization of semiconductor processes.

MASH will develop skills-based educational and workforce development plans to provide companies with an agile system to meet staffing requirements, and at the same time, enhance racial and socioeconomic diversity.

MASH will be a hub for regional and national activities to promote professional education and training, educate the public on semiconductors and microelectronics, share and coordinate materials standards, identify funding opportunities, and build networks and technology road maps.

FACILITIES

COLUMBIA UNIVERSITY

The Columbia Nano Initiative Shared Lab Facilities are open to student and faculty researchers, as well as those from government, start-ups, and industry. The Clean Room offers a comprehensive set of tools for microfabrication and nano-fabrication. The Materials Characterization Laboratory and the Electron Microscopy Laboratory offer state-of-the-art instruments for chemical and structural characterization of materials. The shared facilities stimulates the development of new major research centers.

CNI: nanofabrication

CNI NANOFABRICATION CLEAN ROOM

A ,5000 sqft facility with class 10,000 to 1,000 labs. It is dedicated to providing the processing tools, instrumentation, technical expertise, and team-teaching environment to support and stimulate collaborative research in nanoscale science and engineering. The facility supports the creation and evaluation of devices and materials with state-of-the-art fabrication and characterization equipment. Applications include nanoelectronic and nanophotonic devices, micro and nano-electromechanical systems (MEMS/NEMS), flexible electronics, bio-electronics, nano-bio interfaces, and more.
This laboratory supports multidisciplinary research across many academic departments and disciplines within Columbia University and welcomes researchers from other academic institutions, government laboratories, and industrial organizations ranging from start-ups to large companies. The research bridges the physical, chemical, biological, and medical sciences.

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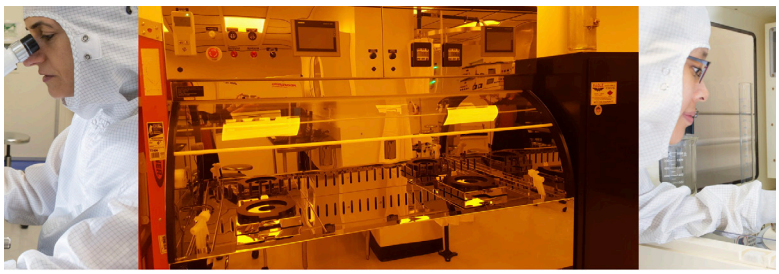

SMCL: characterization

SHARED MATERIALS CHARACTERIZATION LAB

The SMCL provides materials researchers with access to state-of-the-art microscopy, spectroscopy, and diffractometry instrumentation. It supports research across many different departments within Columbia University and welcomes researchers from other academic institutions, government laboratories, and industrial users.

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EM: microscopy

ELECTRON MICROSCOPY

The advanced CNI Electron Microscopy facility includes a Transmission Electron Microscope, two Scanning Electron Microscopes (both located in CEPSR building, one inside the clean room), and a suite of sample preparation instruments. The mission of the facility is to train students and researchers in theory and practice of scanning and transmission electron microscopy and to provide research and education services to the Columbia and greater New York communities. This laboratory supports research across many different departments within Columbia University and welcomes researchers from other academic institutions, government laboratories, and industrial users ranging from start-ups to large companies.

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