

MICROSYSTEMS HUB AT SCHULICH

A high-tech machine shop for micro- and nano-scale technology fabrication



For small businesses and academics alike, access to a high-level cleanroom, advanced equipment and micro/nanotechnology prototyping is rare — and expensive. An affordable answer is right here in Calgary.

The Microsystems Hub at the University of Calgary's Schulich School of Engineering is the only facility of its kind in southern Alberta and one of only 20 across the country.

Opened in 2005 as the Advanced Micro/Nanosystems Integration Facility, our 3,000-square-foot facility supports micro/nanotechnology prototyping for academia and industry. As an open-access facility, we provide cost-effective, low-volume, specialized research and development services.

PARTNERS AND CLIENTS

Having fee-for-service access to our highly specialized equipment and expertise saves a wide range of organizations time and money.

A diverse body of academics require a cleanroom environment for their research — from neuroscientists to veterinarians, from chemists to kinesiologists and faculty from across most engineering disciplines.

Industry partners in need of our services work in areas ranging from drones to defense and from biomedical engineering to energy. For companies, working with the Microsystems Hub eliminates the need to invest in expensive equipment and gives them access to the facilities' highly qualified personnel on a project-by-project basis.

NEED FINANCIAL ASSISTANCE?

Canadian academics can apply for up to \$3,500 in financial assistance through [CMC Microsystems](#). This funding eases the cost of travelling to non-local facilities as well as device processing costs. Application deadlines are monthly.

Industry partners looking to undertake research and development can apply for a number of government research grants from the Natural Sciences and Engineering Research Council of Canada, Alberta Innovates and more.

RESEARCH AREAS SUPPORTED

- RF/microwave cancer detection
- Implantable sensors
- Brain neuron stimulation/recording
- Optics and optical components
- Digital cytometry
- Integrated CMOS sensors
- Muscle interactions with silicon cantilevers
- Controlled placement of nanoparticles
- Microneedles, microfluidics and micropumps
- Square kilometer array
- MEMS and BioMEMS
- Reservoir micromodels
- 3D surface analysis
- Fuel cells

OUR FACILITIES

CLASS 100 CLEANROOM

With no more than 100 particles (sized .5 microns or larger) per cubic metre, the air in this space is pristine when compared to the air in a typical urban environment which contains 300,000 particles of this size per cubic metre. The Class 100 cleanroom is the main wet-processing area of the Microsystems Hub. This ultra-clean room, which is where photolithography is conducted, has controlled yellow light to allow for the handling and processing of light-sensitive materials.

CLASS 1,000 CLEANROOM

This room offers a range of integration, coating, patterning, dicing and inspection tools including both contact and non-contact profilometry, flip chip integration and thin film deposition. Additional wet processing and dry-etching capabilities are also available here.

SERVICES AND EQUIPMENT

Metrology and Inspection

- Mitutoyo FS110 optical microscope with image capture (3D capability)
- Nikon Optiphot inspection microscope
- M-gauge metallization thickness monitor
- Veeco surface analyzer (3D capability)
- Tencor profilometer (3D capability)
- Nanometrics thin-film analysis tool
- 3D rendering PC station
- Stereo microscope

Integration and Packaging

- SET FC-150 Flip-Chip Bonder
- Vacuum sealing station
- Stratasys 3D printer
- Photolithography and wet processing
- SUSS MA/BA6 front and back mask aligner
- 4-foot polycarbonate KOH wet deck
- 8-foot polycarbonate multipurpose wet deck
- 4-foot stainless steel non-standard materials wet deck
- 6-foot stainless steel multipurpose wet deck

Dry-Etching

- Trion reactive ion etcher with inductively coupled plasma source
- Spectra-Physics femtosecond laser micro-machining system

Coating

- 2 multipurpose Laurell spin coaters
- Kurt J. Lesker CMS-18 multi-source sputtering system
- Denton Infinity multi-source electron-beam evaporator
- Denton Desktop sputtering system
- Dry film laminator

Substrate Preparation and Storage

- Ultrasonic cleaning station
- Dump rinser
- Critical point dryer
- YES HMDS oven
- Small oven
- Semitool spin-rinse dryer
- Nitrogen storage cabinet
- Thermolyne Benchtop 1100 C Muffle Furnace, 1.3 litre capacity
- Disco DAD dicing saw