

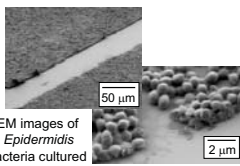
The Laboratory for MultiScale Imaging

A Shared Institute Resource

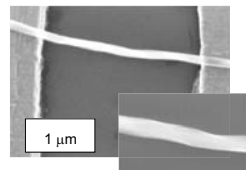
Mission:

Provide state-of-the-art instrumentation and expertise in morphological characterization to elevate the level of morphology-based research at Stevens and provide leverage to attract further support for new self-sustaining programs.

Scanning Electron Microscopy w/ e beam lithography LEO 982 HR FEG SEM



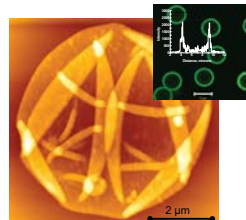
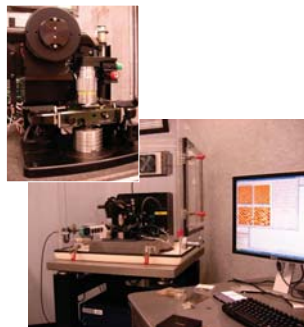
SEM images of *S. Epidermidis* bacteria cultured on a silicon substrate in the early stages of antibiotic-resistant biofilm development. W. Lee, M. Libera, et al.



SEM images of a multiwalled carbon nanotube bridging micropatterned electrodes for single-electron quantum device applications.

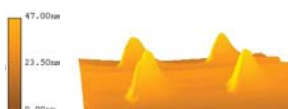
EH Yang et al, Mech. Engr.

Atomic Force Microscope (AFM) Pacific Nanotechnology Nano R w/ Nanolnk dip-pen nanolithography



AFM image of (PMAA/PVCL-NH₂)₅ pH-responsive capsule dried from DI water. Inset shows confocal image of fully hydrated capsules with fluorescent dye in the capsule walls.

V. Kozvoskaya and S. Sukhishvili, *Soft Matter*, in press



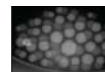
AFM image of electron-beam patterned PEG nanohydrogels on Si.

T. Currie, *Stevens Class of 2009*

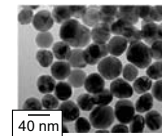
Transmission Electron Microscopy Philips CM20 cryo-TEM/STEM



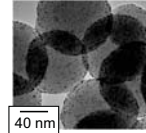
Cryo-STEM Imaging of Copolymer Nanocolloids



Libera et al., *JACS* (2006)

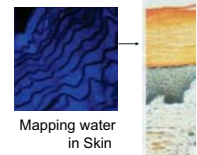


Bright-field TEM image of citrate-reduced silver nanoparticles for ultra-trace chemical sensing and detection based on surface-enhanced Raman scattering.



Gold nanocrystals (2-5 nm) on silica nanospheres to seed growth of dielectric core/metal shell nanostructures for chem/bio sensing and imaging

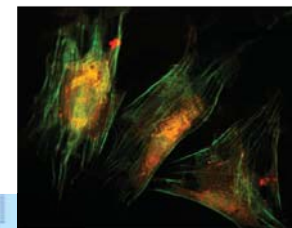
H. Du et al., *Opt. Eng. Lett.* 47(4) (2008)



Mapping water in Skin

The LMSI is a user facility with instrumentation and expertise in morphological characterization over a range of scientifically important length scales. It houses two electron microscopes: a 200 keV Philips CM20 FEG TEM/STEM optimized for high-spatial-resolution microanalysis; and a LEO 982 digital FEG SEM that is particularly well suited for the low-voltage imaging of soft materials, together with a range of supporting ancillary instrumentation. The LMSI also houses a Nikon E1000 fluorescence optical microscope with confocal-imaging capabilities as well as a Pacific Nanotechnology Nano R AFM configured to perform dip-pen nanolithography. The LMSI serves on-campus users from Materials Science, Chemical Engineering, Mechanical Engineering, Environmental Engineering, Biomedical Engineering, Chemistry, and Chemical Biology, among others, as well as a range of academic and industrial users from off-campus. There are currently more than forty qualified self users on the various microscopes in this Facility.

Fluorescence Optical Microscopy Nikon E1000 w/ C1 confocal capability



Immunofluorescence image of Fibroblast cytoskeleton and focal adhesion structure

C. Valmikinathan et al. *Biomedical Engr.*

LMSI Scientific Advisory Board

- ◆ Prof. Christos Christodoulatos
Environmental Engineering
- ◆ Prof. Henry Du
Materials Science
- ◆ Prof. Frank Fisher
Mechanical Engineering
- ◆ Prof. Svetlana Sukhishvili
Chemistry

Further Information

◆ Prof. Matthew Libera,
LMSI Director
milibera@stevens.edu; 201-216-5259

◆ Dr. Berton Greenberg and Dr. Tsengming Chou,
LMSI Staff Scientist
bgreenberg@stevens.edu; 201-216-5258
tchou@stevens.edu; 201-216-5258