SAMPLE PREPARATION AND THERMOMECHANICAL CHARACTERIZATION

Thermal Processing
- 6-ft. chemical fume hood
- Photore sist spin ner
- Oil-trapped vacuum oven
- Ellipsometer

Thermomechanical Characterization
- Thermal Gravimetric Analysis (TGA, TA Q50):
  Temp. range: ambient+5–1000°C
- Differential Scanning Calorimetry (DSC, TA Q2000):
  Temp. range: -90–550°C
- Dynamic Mechanical Analysis (DMA, TA Q800):
  Temp. range: -145–600°C
- Thermal Conductivity Meter (DTC-300):
  Thermal conductivity range: 0.1–40 W/m.K

FEES FOR SERVICE (As of June 2013): Fees are subject to change without notice;
internal rate is applied to users or PIs affiliated with Stony Brook University faculty positions.

<table>
<thead>
<tr>
<th>Use of Facility</th>
<th>Sample Preparation</th>
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<tbody>
<tr>
<td>Internal: $69/hour</td>
<td>Internal: $68/hour</td>
</tr>
<tr>
<td>External: $98/hour</td>
<td>External: $96/hour</td>
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</tbody>
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CONTACT US

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ThINC is a core facility of the Advanced Energy Research and Technology Center (AERTC). It is dedicated to establishing partnerships between Stony Brook University and industrial laboratories for enabling cutting-edge research in nanoscience.

We are a new comprehensive core for multiscale characterization and imaging, with facilities for sample preparation, imaging and thermo-mechanical characterization. We have PhD scientists ready to run your samples and provide guidance in choosing the best solutions for your materials-related problems.

aerc.org
**SCANNING PROBE MICROSCOPE WITH HYSITRON ATTACHMENT**

Bruker Dimension ICON
- Nanomechanics/nanindentation
- Nanoelectrical characterization
- Imaging in fluid
- Heating and cooling stages
- Contact, Tapping and ScanAsyst modes

Scanning probe microscope images: (left) 3D image of photore sist-imprinted patterns on silicon wafer scanning by Cont act mode; 2D image of organic photovoltaic polymeric solar cell (PMMA/ P3HT: PCBM) scanning by PeakForce TUNA mode, showing the topography (middle) and conductive current (right) measurement.

**UPRIGHT CONFOCAL MICROSCOPE**

Leica TCS SP8 X
- Upright geometry suitable for materials science applications with opaque samples or substrates
- Immersion lenses permit imaging of submerged samples
- GaAsP hybrid detection system (HyD)
- White light laser 470–670 nm, and UV laser 405 nm
- Tokai Hit Hit stage incubator providing 37°C and 5% CO₂ (live cell imaging)

Confocal microscope images: (left) Organic photovoltaic polymer MEH-PPV electrospin fibers; (middle) Dental pulp stem cells grown on polyisoprene (PI) thin film treated with micro-sized beads taken together by incident (fluorescence) and transmitted (DIC) lights. Stained with Alexa Flour Phalloidin 488 (actin filaments) and DAPI (nuclei); (right) Organic photovoltaic polymer P3HT blended with PMMA.

**TRANSMISSION ELECTRON MICROSCOPE (TEM)**

JEOL JEM 1400
- Suitable for materials science, polymer and biological applications
- Features available: Cryomicroscopy, STEM, EDS for elemental identification
- Acceleration: Vol. = 40–120 kV
- Magnification: x5,000–2,000,000/x120–4,000

TEM images: (top) Graphitized carbon, showing a distance between graphene layers of approximately 3.4 Å; (middle) Synthesized gold nanoparticles, with average size ~40 nm; (bottom) P3HT:PCDTBT blend polymer thin film.

**EM SAMPLE PREPARATION**

Leica EM UC7 with Cryo Attachment
- High-quality ultramicrotome for precise room temperature and cryo sectioning (-15 ~ -185°C)
- Prepare excellent quality semi- and ultra-thin sections, as well as the perfectly smooth surfaces for light, electron and atomic force microscopy examination
- Diamond and glass knives available
- Ideal for elastomers, polymers, organic photovoltaics
- Well suited for biological samples, either embedded or lyophilized

**AMG EVOS FL MICROSCOPY**

- Light Cubes: DAPI (Ex 360/ Em 447 nm)
- GFP (Ex 470/ Em 525 nm)
- White (non-transparent samples)
- With monochrome camera, it can capture images at 16-bit monochrome TIFF or PNG; 24-bit color TIFF or PNG; JPEG or BMP (1280 x 960 pixels)
- Equipped with Biopan stage temperature controller providing 37°C for live cell observation

**SPECTROSCOPIC ELLIPSMETRY**

Horiba UVISEL FUV
- Spectral range from 190 to 880 nm; thin film thickness from 1 Å to > 30 μm
- Nanometer film thickness determination with multilayer and interface capabilities
- Optical constant (refractive index n, extinction coefficient k) measurements for isotropic and anisotropic films
- Transparent samples with backside reflections are eligible