

**Thermofluids Laboratory**

This is a 300 m<sup>2</sup> laboratory, one of the laboratories at the CUNY Energy Institute recently renovated at a cost of \$4 million. It is a wet laboratory with two fume hoods and full utilities such as compressed air, three-phase 220 Volt AC, steam boiler, and 20-m of lab benches and storage cabinets. It is located on the second floor directly below the Analytical Instrument Laboratory of the CUNY Energy Institute which is located on the third floor of Steinman Hall. A heat transfer flow loop is available for determining the heat transfer and pressure drop characteristics of PCM nanoemulsions under the proposed PIRE project. The flow loop is equipped with a gear pump, flow meter, heat exchanger, Ohmically heated test section, PC-based data acquisition system and a 14 kW DC power supply.

A gamma-ray source (5 milliCurie Cs-137), multiple NaI scintillation detectors, and a Multichannel Analyzer are available for gamma densitometer measurements. This densitometer system can be traversed horizontally to obtain radial distributions of solid particle volume fractions in a large pipe in particle sedimentation studies.

**Imaging Equipment:**

- Photron Fastcam Imagers: Capable of 10,000 FPS at 200 px by 200 px
- Point Grey Research Flea 2: General use imager, capable of 80 FPS at 640 px by 480 px
- A 100 keV X-ray source (Oxford Instruments) and an X-ray imager (Hamamatsu Photonics X-Cube) are available for measuring the X-ray attenuation coefficient of ionic liquids. Gamma ray sources, NaI detectors and multichannel analyzer are available for measuring the gamma attenuation coefficient of complex fluids.