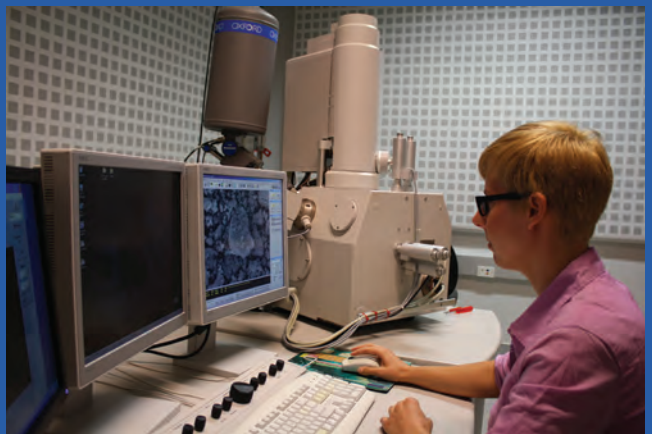




Shared Experimental Facilities

Your Partner for Materials Characterization
at the University of California, Santa Barbara



MATERIALS RESEARCH LABORATORY AT UCSB: AN NSF MRSEC





Shared Experimental Facilities are a cornerstone of the MRL and an enabler of the core research and educational missions of the University.

In expertly staffed, open-access laboratories, students, faculty, and visiting researchers collaborate across disciplinary boundaries every day at the University of California, Santa Barbara.

Through the Materials Research Facilities Network, academic, government, and industrial collaborators regularly make use of MRL instrumentation for their research needs and develop ongoing relationships with MRL staff and researchers.

Your Partner for Materials Characterization



www.mrfn.org
mrfn@mrl.ucsb.edu

The MRL's Shared Experimental Facilities boast a broad spectrum of capabilities for materials characterization and analysis.



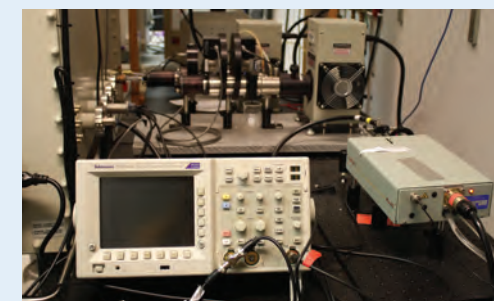
Nuclear Magnetic Resonance measurements in the Spectroscopy Facility probe structure, dynamics, and chemical environment of molecules.



Microwave reactors in the Polymer Facility create controlled conditions for monomer synthesis and polymerizations.



The FTIR/Raman Spectrometer probes chemical bonds and structure in molecular materials.



Solar Energy is simulated in the Energy Facility to evaluate solar cells.

Frequency

Radio

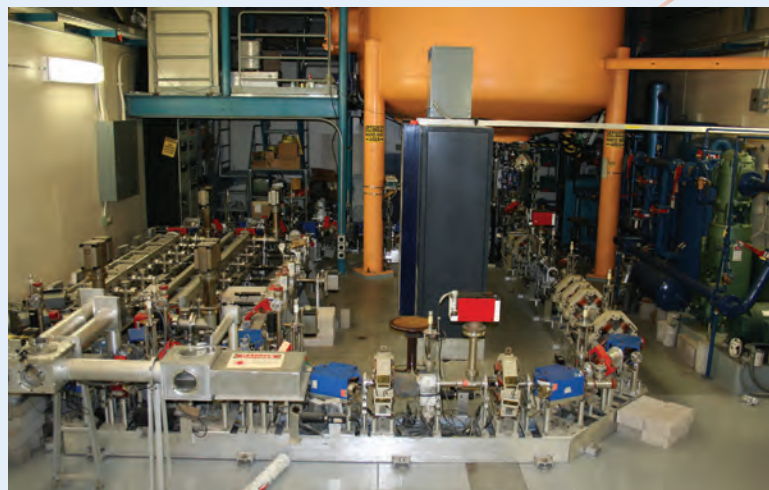
Microwave

Terahertz

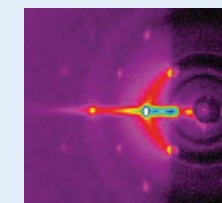
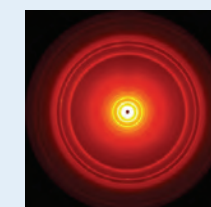
Infrared

Ultraviolet

X-ray

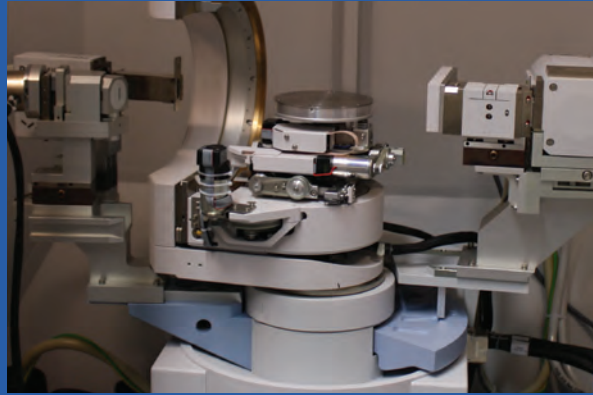


The Free Electron Lasers at the Terahertz Facility, an MRL partner, provide the world's brightest source of tunable radiation from 0.1 THz to 5.0 THz.

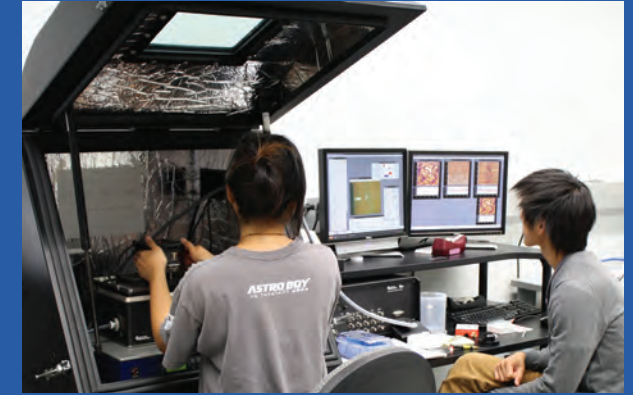
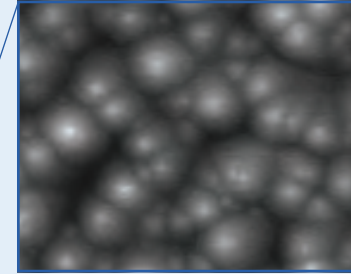
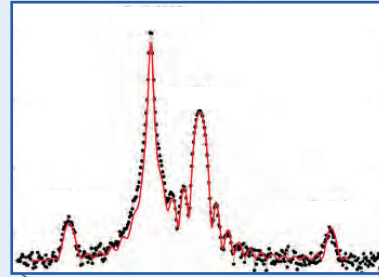


The X-Ray and TEMPO Facilities provide diffraction tools for characterizing the structural properties of a wide range of materials.

The comprehensive suites of instrumentation provide techniques to analyze every aspect of a sample's structure and composition.



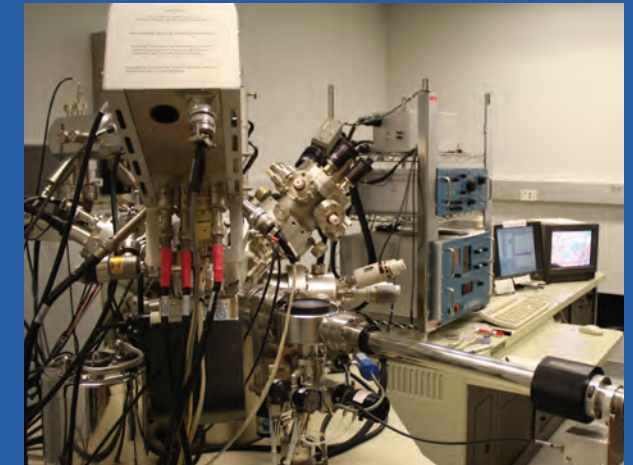
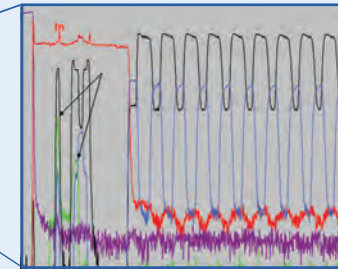
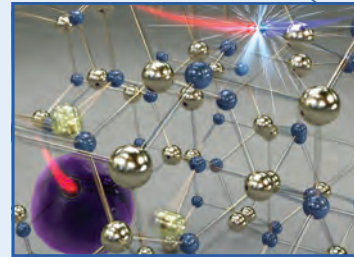
X-Ray Diffraction



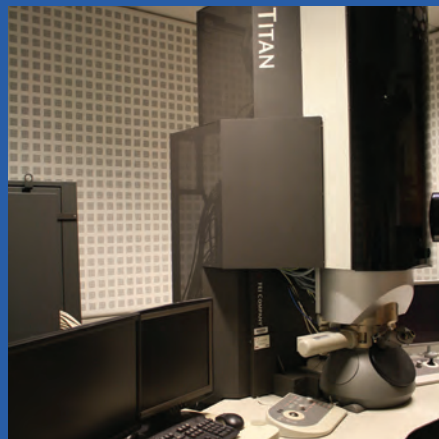
Atomic Force Microscopy



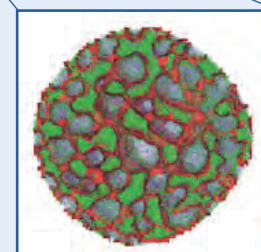
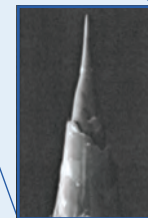
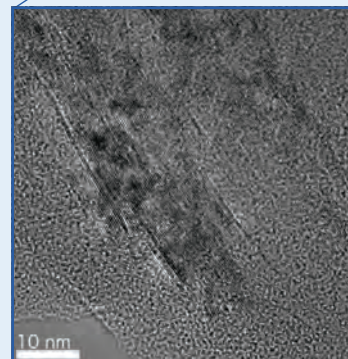
High Performance Computing



Secondary Ion Mass Spectroscopy

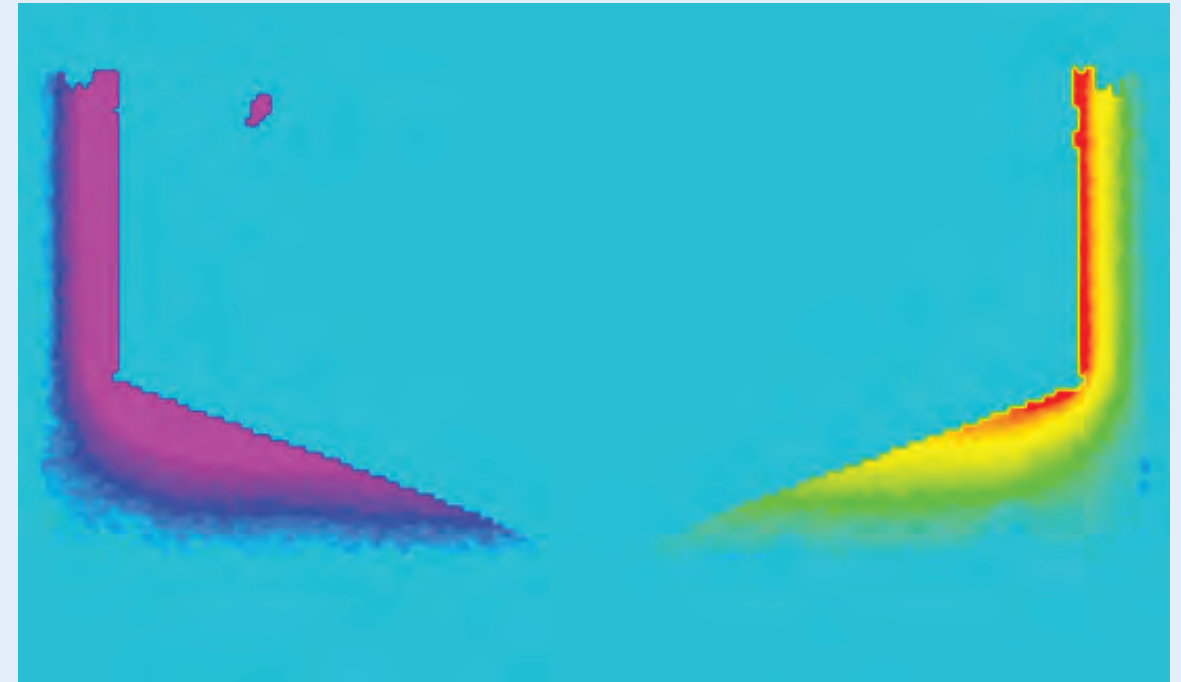
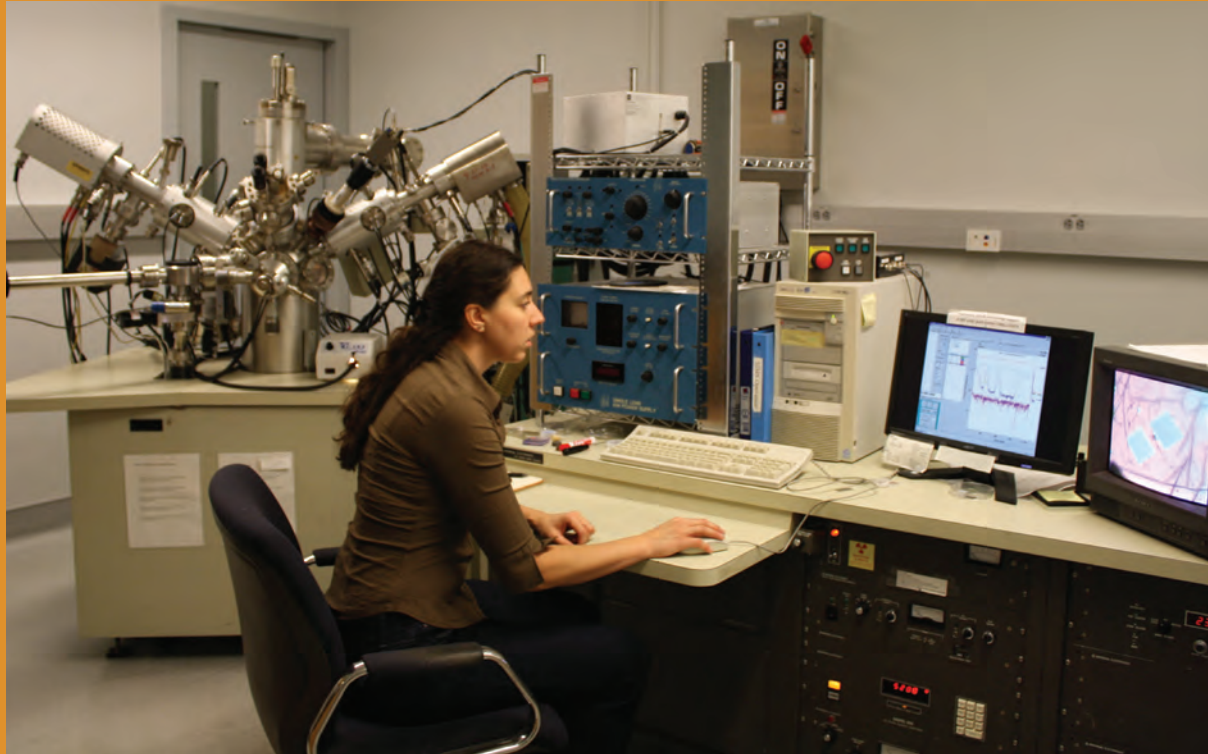


Transmission Electron Microscopy

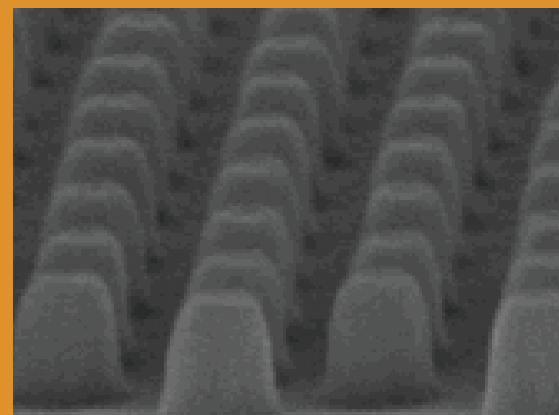
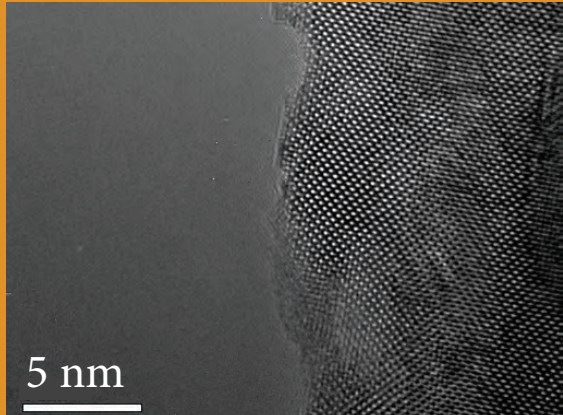


Atom Probe Tomography

Whether at millimeter, micron, or nano scale, the instruments in the MRL Shared Experimental Facilities investigate internal and external structure.



Unique super-wide bore NMR technique allows rheological imaging of silicone oil under shearing forces.



Length Scale

Sub-Å

Å

nm

μm

mm

Computer modeling

Atom Probe

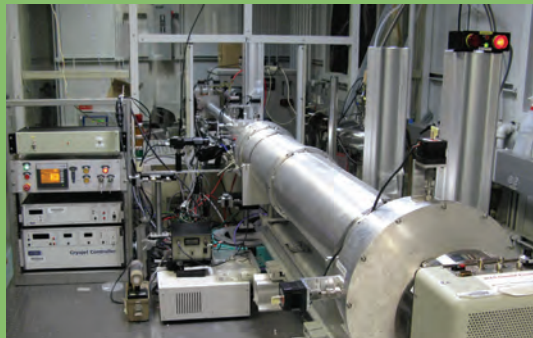
TEM

SEM, GPC, DLS, FIB

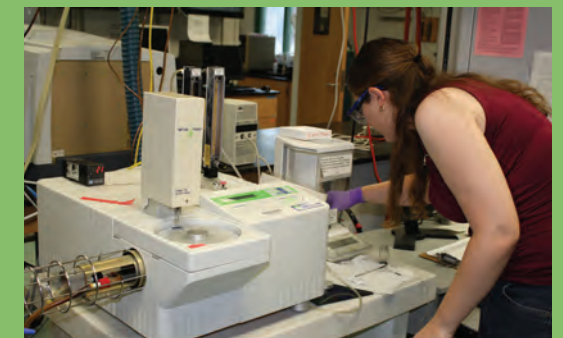
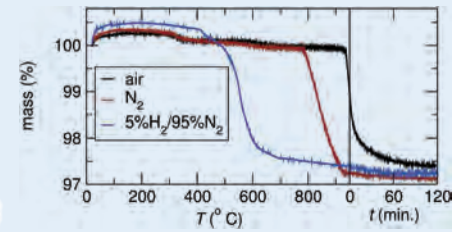
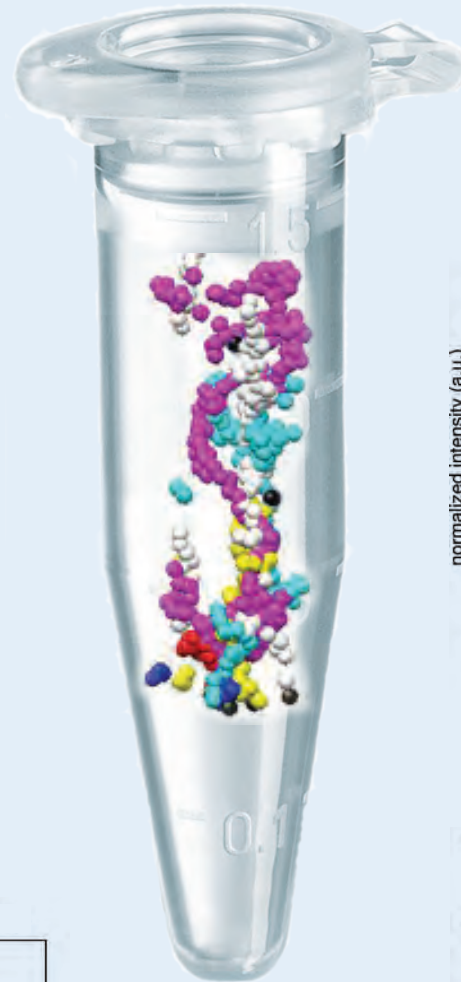
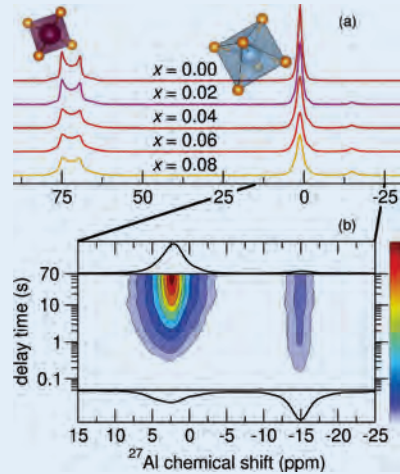
XRD

MRI

Profilometer



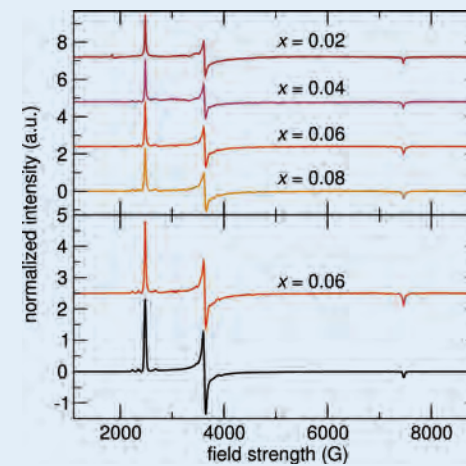
Small-Angle X-Ray Scattering



Thermo Gravimetric Analysis



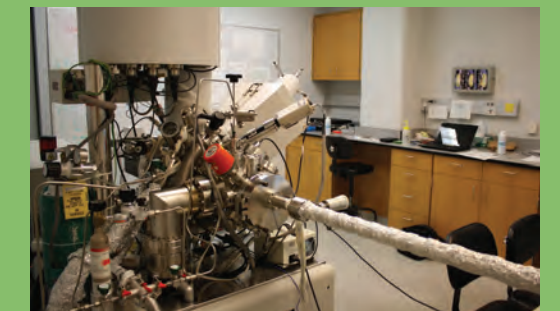
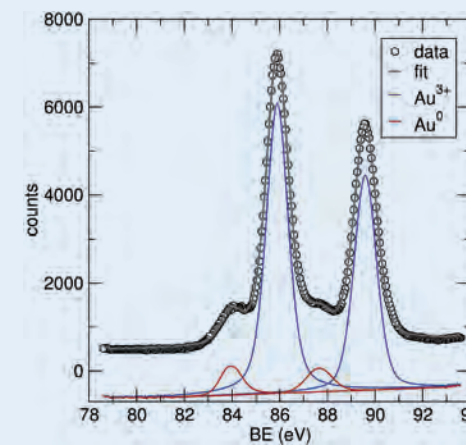
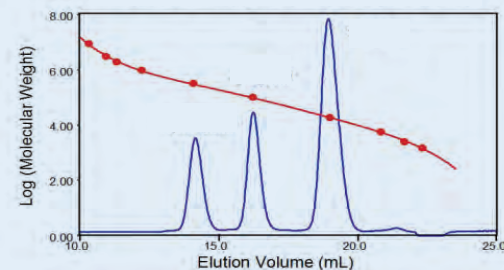
Nuclear Magnetic Resonance



Electron Paramagnetic Resonance



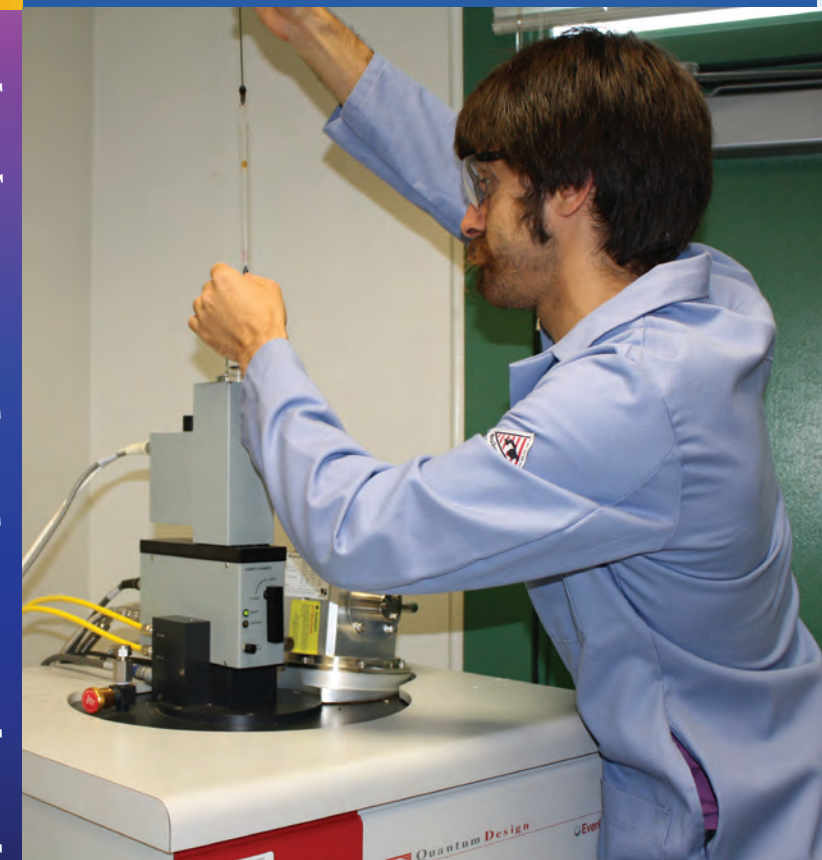
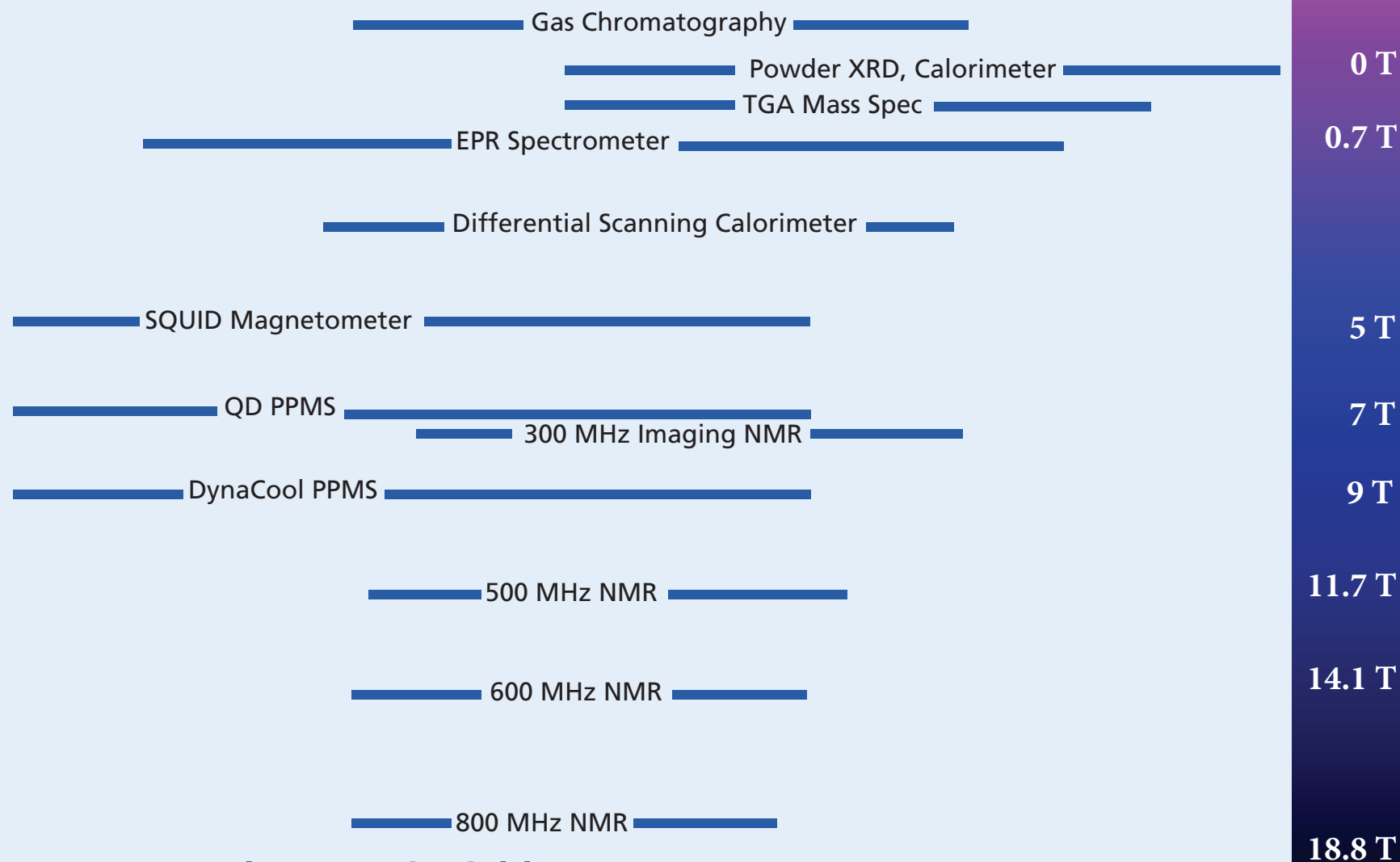
Gel Permeation Chromatography



X-Ray Photoelectron Spectroscopy

With powerful magnetic fields and variable temperatures, instruments at the MRL reveal the structure, dynamics, reaction state, chemical environment, and magnetic and electronic behavior of materials with high sensitivity.

2 K 4 K 77 K 220 K 273 K 300 K 373 K 400 K 473 K 673 K 1373 K 1773 K



The SQUID Magnetometer uses low temperature and strong magnetic fields to detect minute quantities of paramagnetic ions, quantify the number of unpaired electrons and to characterize all kinds of magnetic materials.

Temperature and Magnetic Field



The MRL's Shared Experimental Facilities are constantly expanding and improving to reflect the state of the art, and even to help advance it.

Due to excellent maintenance, management and operation of our Facilities, donations of major equipment are very common.

Donors gain dedicated expert staff to maintain and augment their specialized, high-profile instrumentation, freeing up valuable researcher time, and making their investment available to a wide range of colleagues.

The MRL is proud to share its facilities with academic, government, and industrial users. Please contact us for collaborative opportunities.

www.mrl.ucsb.edu/shared-experimental-facilities
mrfn@mrl.ucsb.edu



www.mrfn.org

Your partner for Materials Characterization



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Division of Materials Research**



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