CMSE
MIT Center for Materials Science and Engineering

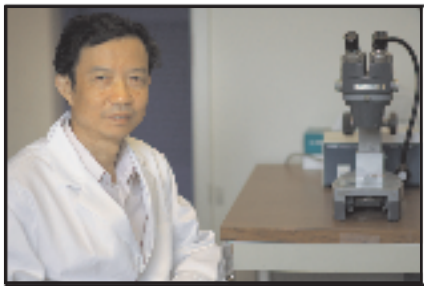
MEET OUR NEW STAFF MEMBERS

Newsletter No. 8

Focus on Shared Experimental Facilities

October 2006

We are happy to introduce three new staff members who have joined our Center's Shared Experimental Facilities. Please use them as a resource; they are all experienced technical instructors and researchers and are happy to help you.

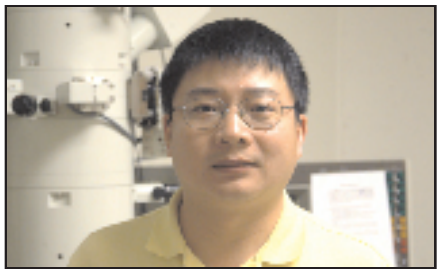


Dr. Shaoyan Chu, Research Scientist
Crystal Growth Facility

Dr. Chu received his PhD in Condensed Matter from Beijing University of Aeronautics and Astronautics in 1991. His research is focused on the design, synthesis and properties of electromagnetic materials including superconducting, ferromagnetic, and nano-particle materials. Much of this research utilizes crystal growth techniques that can make samples that are adequate for the investigation of intrinsic properties of these substances. Current interest is the exotic state of correlated electrons in single crystals. Fundamental studies involve strong fluctuation and /or geometric frustration of quantum spins in low-dimensional lattices and phase equilibrium and transformation in a multiphase system

Dr. Scott Speakman, Research Specialist
X-ray Diffraction Facility

Scott A. Speakman comes to CMSE after 3 1/2 years as a postdoc in the Diffraction User Center at Oak Ridge National Laboratory. Prior to that, he was a graduate student in the X-ray Diffraction Lab at Alfred University. His research has included work with materials for solid oxide fuel cells, hydrogen storage, refractory alloys for thermoelectric reactors, and nanocrystalline scintillators for radiation detection and medical imaging. Scott's primary interest is the application of in-situ diffraction techniques to these and many other research experiments, though he will gladly work with MIT researchers on any area of interest that can benefit from X-ray, synchrotron, or neutron scattering data.



Dr. Yong Zhang, Research Specialist
Electron Microscopy Facility

Yong Zhang was awarded advanced degrees in Materials Science & Engineering and Electrical Engineering from universities in China and the U.S.. Prior to joining CMSE, he worked in the department of Physics & Astronomy at the University of Delaware, running the electron microscopy facility. He has more than 10 years of experience in the operation of electron microscopy, as well as EM maintenance and user training. His specialty is the application of transmission electron microscopy and sample preparation. He has done intensive studies on nanostructured magnetic materials and engineering structural alloys. Yong's work has been published in journals such as Nature, Journal of American Chemical Society, Applied Physics Letter, and Physics Review.

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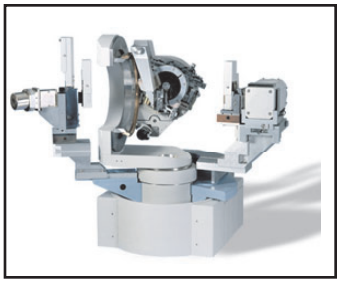
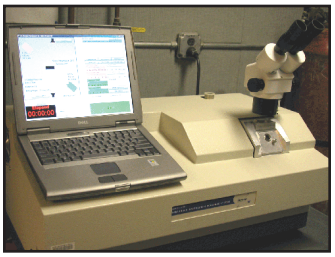
INSTRUMENT SPOTLIGHT

PANalytical X'Pert Pro
X-ray Diffraction Facility



More than meets the eye! The X'Pert Pro can be reconfigured to use a multitude of optics and sample stages in just a matter of minutes, allowing you to redesign the instrument to fit your experiment, not redesign your experiment to fit the instrument. Collect XRPD, GIXD, PTS, XRR, and many other acronyms at temperatures from 11 K to 1200 C!

Fischione Ion Mill
Electron Microscopy Facility



The preparation of good samples for TEM is a major prerequisite for obtaining the best results. The Fischione 1010 Ion Mill is a new tool that provides the capability of low-voltage, low angle ion milling of cooled samples, minimising damage to the sample caused by the ion beam. The system is easy to use and requires a minimum of operator oversight during the milling process. Multiple steps, using different milling parameters, can be set up for automatic sequential processing.

ICP/OES Spectrometer
Crystal Growth Facility

Inductively Coupled Spectrometers (ICP) has become an indispensable tool for chemical elemental analysis for quality control and major elements determination for composition, where hundreds of samples can be processed every day. Because of its unique optical system, the ICP-OES system represents a powerful, flexible and rapid quantitative analytical method for environmental and industrial applications.

Delay Line Detector upgrade for Kratos Axis Ultra XPS
Analytical Facility

This detection system upgrade is a 128 channel detector that replaces the eight channel detector previously used for spectroscopy in our circa-2000 Kratos Model Axis Ultra XPS. The design of the detector beefs up the sensitivity of the system for small area analysis and also allows us to use all 128 channels in parallel to rapidly collect narrow-energy-range spectra in "Snapshot" mode.

The increase in data acquisition speed in "Snapshot" mode benefits users who don't need high energy resolution and want to collect data from elements with weak signals, and/or from small analysis areas, and/or from samples at shallow acceptance angles (e.g. during angle-resolved depth profiling). It's especially useful for researchers who would like to take advantage of chemical spatial imaging with the XPS.

Other news:

See the brand new CMSE website for information on equipment, lab rules, booking, and training.

The thermal characterization lab is now being managed by Shaoyan Chu, and Tim Mc Clure is taking over responsibility for the spectrophotometers and the fluorimeter.