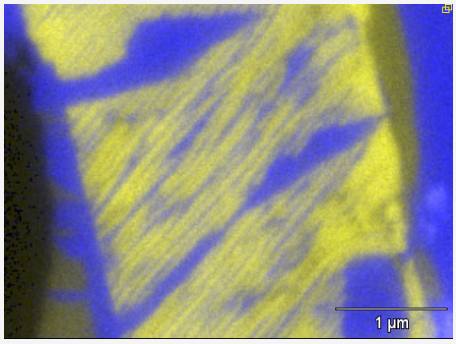
JEOLink

JEOL USA SEM & TEM News

January 2009

Extreme Image



An EDS map of TiO2 in FeOx with <100nm spatial resolution at 30,000X. From the JEOL Analytical Field Emission SEM, the JSM-7600F.

First-of-its-kind E-beam Installation in Pacific Northwest

An etching of the University of Washington seal made with the JEOL direct write e-beam system at Cornell Nanoscale Science & Technology Facility.

JEOL USA will install the first e-beam direct-write-on-wafer lithography tool to support nanoscience research in the Pacific Northwest when the **University of Washington** takes delivery of a JEOL JBX-6300FS e-beam system. The system will be installed in the state-funded Washington Technology Center Microfabrication Lab. Funding for the tool acquisition was provided through a state-supported STAR researchers' grant to Michael Hochberg, Assistant Professor of Electrical Engineering, and a matching grant from the Washington Research Foundation. Read the full announcement>>>

Featured Product: NeoScope

It's a **benchtop**, no it's a **tabletop**, no it's a **desktop** SEM from JEOL! However you refer to it, the JEOL NeoScope is a cost-effective introduction to the SEM world for optical microscopists needing the depth of field of a true SEM, with point-and-shoot simplicity. Or, it's a great SEM in a small package for the economy-minded lab. Available exclusively through our partner, Nikon.

Nikon™
The Eyes of Science

JEOL USA in the News

UTSA Sees Big Things Ahead with Microscope
(*San Antonio Express* 1/23/08)

New USC Nano Imaging Center Opens

1st Atomic Scale Compositional Images of Fuel Cell Nanoparticles (Univ. Texas at Austin)

Hi-res Snapshot of Transformation of Nanoscale Structures (LLNL)

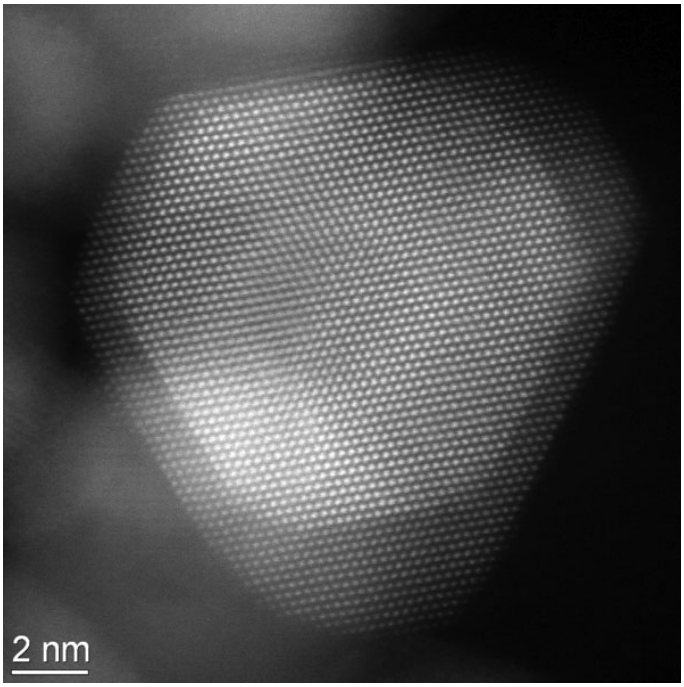
From Melamine to Cocaine, They See it All

AAFS Emerging Forensic Scientist Award Goes to MVA Scientific's Researcher

MVA Scientific Consultants' Whitney Hill has been named a recipient of the 2008 Emerging Forensic Scientist Award. Whitney will be presented the award at the American Academy of Forensic Sciences (AAFS)61st meeting in Denver, where she will present the paper that earned her recognition. Joining Whitney will be MVA Scientific Consultants' Executive Directors Dr. James Millette, presenting a paper entitled "Microscopy of Soot Particles", and Richard S. Brown, presenting "Variation of Refractive Index and Elemental Composition Within a Mineral Wool Product".

Read about MVA Scientific Consultants in our new REALab feature article.

Kleberg Foundation Gift Will Put UTSA Nanotechnology Research on the Map



HAADF image of a AuPd core-shell nanoparticle taken on the aberration-corrected JEOL JEM-2200FS at Oak Ridge National Labs. Image courtesy of Miguel Yacaman at UTSA.

The University of Texas at San Antonio (UTSA) will purchase a second-generation

Upcoming Meetings & Tradeshows

TMS
The Materials Society
Booth #532
San Francisco, CA
Feb 16-18, 2009
JEOL will be exhibiting the JSM-6610LV in the booth. Contact us for a demonstration!

AAFS
American Academy of Forensic Sciences
Booth #400/402
Denver, CO
Feb 18-20, 2009
JEOL will be exhibiting the AccuTOF-DART mass spectrometer and the CarryScope mobile SEM. Contact us for a demonstration!

Advanced Lithography
San Jose, CA
Feb 23-27, 2009
JEOL will sponsor the TCA Workstations.

Pittcon
Booth #3948/4048
Chicago, IL
Mar 9-12, 2009
Nikon Instruments will demonstrate the NeoScope tabletop SEM in the JEOL booth. We will demonstrate the JSM-6610LV SEM, the AccuTOF-DART mass spectrometer, and Delta NMR software.

Contact us for demonstrations!

Don't miss
The Japan Symposium at Pittcon
Tuesday, March 10
3:00 - 3:45

Dr. Michael M. Kersker presenting:

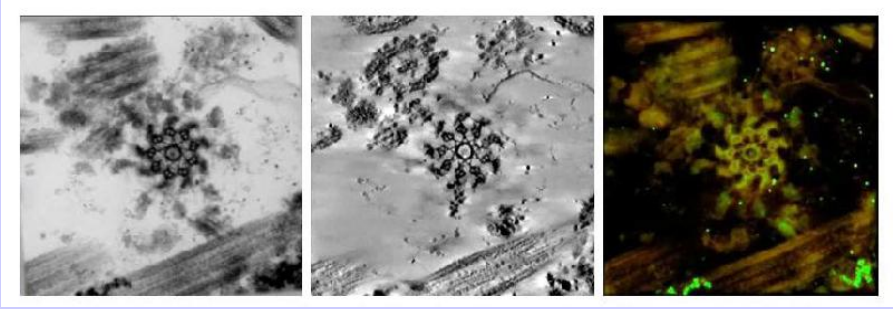
"An Electron Microscope for Nanotechnology: To See Something Small You Need Something Big"

aberration corrected TEM, one of only two worldwide, with a $1.2 million gift from the Kleberg Foundation. This new JEOL TEM will be housed in UTSA's Advanced Microscopy Laboratory under the supervision of world-renowned researcher Miguel Yacaman, chair of the College of Sciences' Department of Physics and Astronomy. The TEM will support first-class research and "open up the world of science to researchers at the atomic level much the same way that telescopes such as the Hubble opened up the universe to astronomers," Yacaman said. Read the full story in *Nanowerk News>>>*

Tomography Takes TEM Imaging to New Dimensions

JEOL USA offers the latest tomography solutions for transmission electron microscopy (TEM). Tomography, or 3-D reconstruction of multiple TEM images, has developed in the past decade as one of the more important applications in the field of life sciences and, more recently, in the field of materials science.

Through its applications group, JEOL USA offers tomography support that consists of three software packages: SerialEM and IMOD, both developed at the University of Colorado (Boulder), and Chimera, which was developed at the University of California San Francisco.



Tomography results from resin-embedded basal bodies (left to right): the aligned images from the tilt series, the central section of the 3D reconstruction, and the volume rendering of the 3D reconstruction. Data courtesy of Dr. Geimer, Univ. Bayreuth

"The use of these very sophisticated software packages for tomography with full support from JEOL resonates extremely well with our customers and provides us with a very strong competitive advantage," said Dr. Jaap Brink, TEM Applications Specialist at JEOL. This comprehensive tomography solution has been successfully applied to the TEMs in the JEOL line-up, starting with the recently introduced 120 kV JEM-1400 up to and including the 300 kV liquid helium-cooled energy-filtered JEM-3200FSC. "The success of this process reflects to a significant degree the commitment of the developers in releasing high-quality software and their responsiveness to user requests," said Brink. Examples of 3D tomography .avi files can be seen on the JEOL USA website.

Each of these software packages is freely available and has become the de facto academic standard for routine tomography acquisitions, processing and visualization of resin-embedded as well as beam-sensitive vitrified specimens.

Quick Links

JEOL News Magazine
July 2008 - Volume 43 (Note: requires online registration to download).

Invitation to the SEM World

Energy Table for EDS Analysis

A Guide to Scanning Microscope Observation

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Products
Resources
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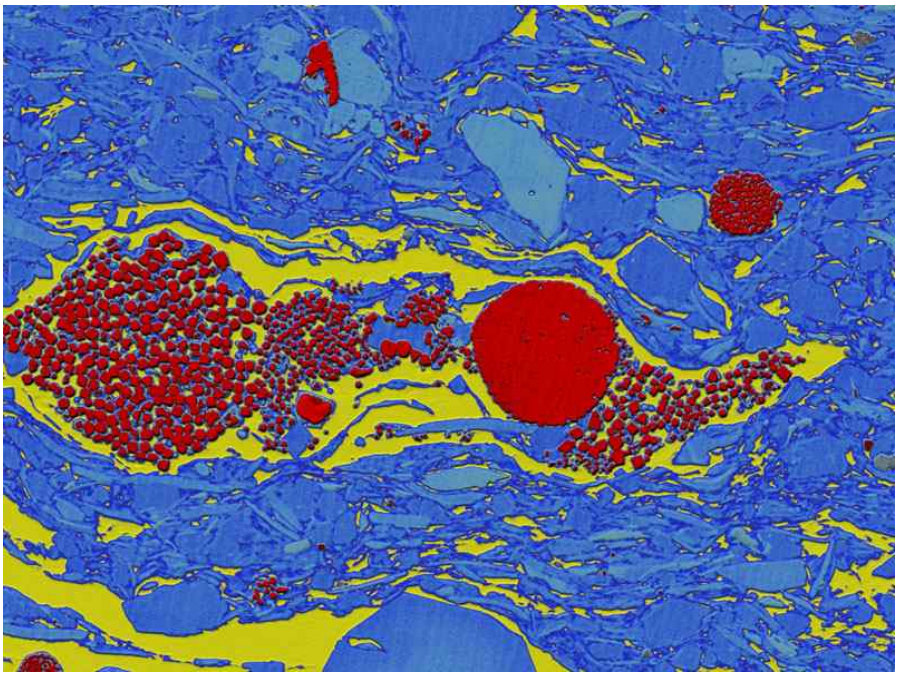
Energy Researchers Look at Cross Sections of Shale



Several energy companies that are investigating alternative sources of fuel oil have turned to JEOL for a new sample preparation solution. Using a process unique to JEOL - an ion beam cross section polisher - they create pristine cross sections of shale for imaging in the SEM.

Shale is composed of carbonates, silicates, iron sulfide, and kerogen. When heated, kerogen can release hydrocarbons, or fossil fuel. A complex network of kerogen veins run through the shale, and it is the composition of the shale and ease of extraction of the kerogen that makes it viable for extracting oil.

Shale crumbles easily, and its complex hard and soft composition make it difficult to prepare cross sections for imaging with the SEM. The JEOL Cross Section Polisher creates a pristine cross section, allowing every detail in the shale to be seen under the microscope without smearing the clay or compressing the porous veins throughout the sample. This process is far superior to the standard technique of cutting slivers of the shale with a razor blade, or using a mechanical polisher to smooth the sample. With the JEOL cross sectioning technique, researchers can clearly see the network of veins of kerogen in the sample to determine the viability of the shale deposit. They also make 3D reconstructions or movie files that show sequential images of the composites in the shale using the JEOL Focused Ion Beam (FIB) system that produces nanometer-thin slices of the sample.

See our gallery of cross section images>>>>