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JEOLink

JEOL USA News - Imaging & Microanalysis and More

Issue: #51

September - October 2014

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Upcoming Events

Colorado MAS Fall Meeting

Golden, CO
 Oct 9

Image Contest

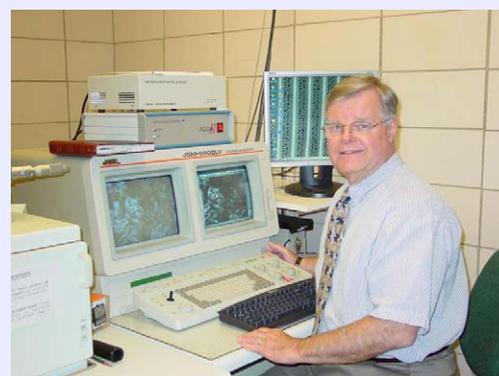
We have had so many excellent submissions this year for our first Image Contest, and we still have 4 months to go. At the end of the year we will produce a 2015 calendar with all of the winning images.



The winning image for the month of August, entitled "A Plant's Useful Kidney Stone," was submitted by Harry T. (Jack)

Horner, Ph.D., Director, University Professor & Professor of Genetics, Development, and Cell Biology, Iowa State University. Prof. Horner says that the sample is, "a spherical aggregate (druse) of calcium oxalate; a substance commonly produced by many plant organs, such as the leaf. It is the main substance composing kidney and bladder stones in humans."

"In plants it is not a pathological condition. It is typically formed in living cells in one of two hydration forms and five general shapes: druses, prisms, raphides (needles), crystal sand and styloids. The function of these crystals varies depending upon the tissue and plant organ in which they occur: calcium storage; ion balance, protection, sequestration of oxalate (a metabolic endpoint of conversion of ascorbic acid [vitamin C formed only by plants] in both plants and animals - combines with the blood calcium in kidneys to produce acicular crystals - which can aggregate to form stones), and light gathering and reflection.



Prof. Jack Horner, Iowa State University

COMS NanoUtah 2014

Salt Lake City, UT

Oct 13-15

Southern California Society for Microscopy & Microanalysis

Duarte, CA

Oct 23

*** **MS&T** ***

Pittsburgh, PA

IT300LV SEM

ElementEye EDXRF

NeoScope

demos

Oct 14-15

AReMS

Knoxville, TN

Oct 16-17

Society of Forensic Toxicologists (SOFT)

Grand Rapids, MI

Booth #301

Oct 21-23

Nanomaterials Seminar

Hosted by McCrone Westmont, IL

Oct 29

*** **ISTFA** ***

Houston, TX

JSM-6010PLUS

ElementEye EDXRF

NeoScope SEM

Booth #312/212

Nov 11-14

Society for Neuroscience

"It is the latter function that the druse has in the selected image. It is found in the living photosynthetic cells of the leaves of certain plants growing under low light intensity. With its many facets it collects and reflects the sunlight to the surrounding chloroplasts."

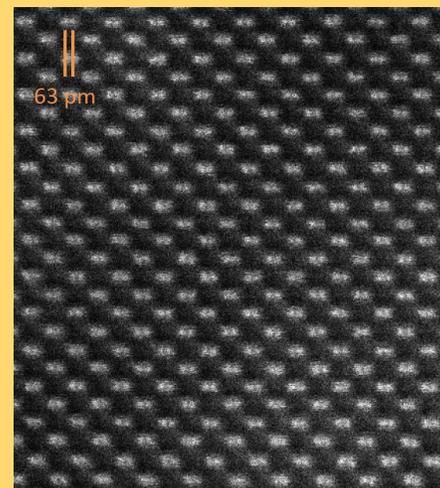
Prof. Horner manages the Microscopy and Nanomaging Facility (MNIF) which utilizes a JEOL JSM-5800 SEM and JEOL JEM-2100 TEM in its work.

Take your best shot!

To participate in the JEOL Image Contest, [click here](#) for the guidelines and Image Gallery. The winning image is selected on a monthly basis. The next deadline is September 30th, but we've extended to October 3 since the JEOLink is a bit behind schedule!

Several images have been selected by C&E News for inclusion in their "[Chemistry in Pictures](#)" blog.

Grand ARM - Extreme Resolution TEM



JEOL USA gave customers a preview of a new atomic resolution microscope at the Microscopy & Microanalysis 2014 conference in Hartford, CT that has just been announced by JEOL, Ltd. (Akishima, Japan) on a global scale.

The new **JEOL JEM-ARM300F** Transmission Electron Microscope exceeds atomic resolution boundaries for any commercially-available TEMs today. The 300kV microscope, nicknamed the "Grand ARM," increases STEM resolution to 63 picometers.

Designed to meet the most advanced materials development requirements for atom-by-atom characterization and chemical mapping, the Grand ARM offers the highest level of performance in the JEOL line of atomic resolution microscopes. The JEOL ARM series, introduced in 2009, offers unprecedented stability and aberration correction. The 200kV system, the JEM-ARM200F, has already gained worldwide use with over 100 units installed at some of the most advanced research facilities.

Washington, DC
Nov 16-19

Eastern Analytical Symposium

Somerset, NJ
Nov 17-19

Fall MRS

Boston, MA
Dec 2-4

**** To request a demo please contact your local sales representative.**

Training



2014 Training Schedule at JEOL USA



Hooke College of Applied Sciences SEM/TEM Training

JEOL in the News

Promising ferroelectric materials suffer from unexpected electric polarizations

New Materials Analysis Facility Under Construction at Diamond

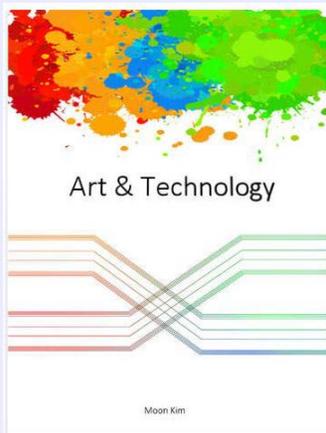
Nanoparticles Aid the Microscopic Detection of a Protein Relevant to Cancer

Imaging of WOx Clusters on ZrO2 Nanocrystals in WOx ZrO2 Catalysts

New Resources

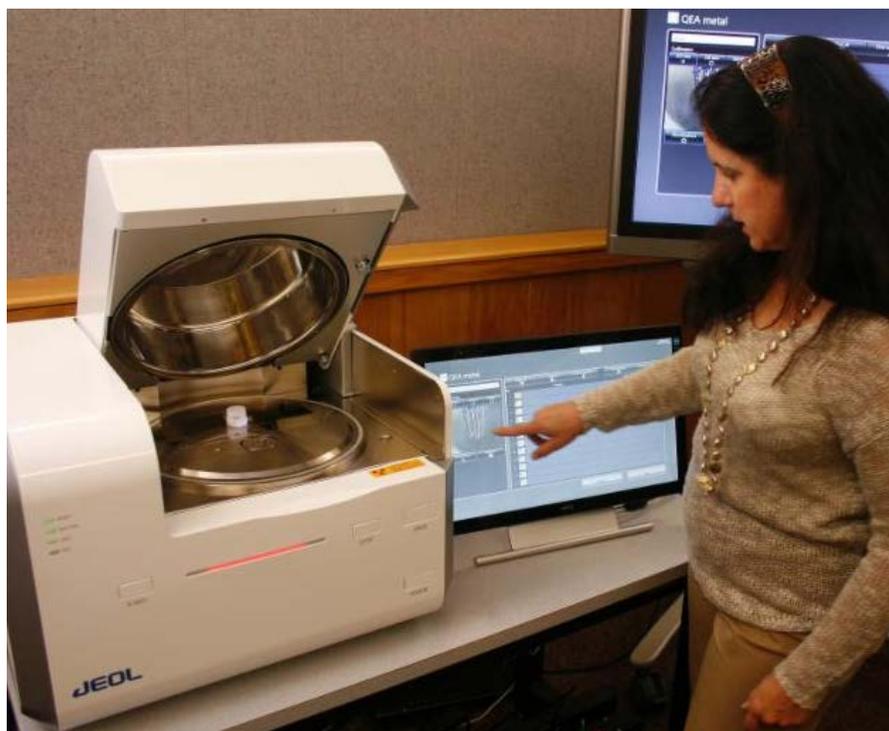
SEM Selection Guide

Art and Technology Converge in New AppBook



As Director of the Nano and Beyond Lab at the University of Texas (Dallas), [Dr. Moon Kim's](#) vision goes beyond nanoscale research and looking at atom-to-atom relationships to helping a global audience better understand the world of science. To this end, he published an animated, interactive iBook entitled "[Hello, Nano](#)" in 2012 to educate young students in an engaging and entertaining way. Now he's expanded the learning experience through a new AppBook, "[Art and Technology](#)," that explores how all forms of art - from painting to fashion to digital games - have been interwoven with technology, even since early times. [Read More >>>](#)

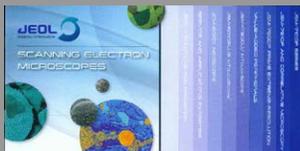
New EDXRF for Fast, High Sensitivity Analysis - Introducing ElementEye



Donna Guarrera prepares to run a sample on the new ElementEye JSX-1000 EDXRF in the demo lab.

If fast, automated EDXRF is needed, take a look at our new [ElementEye](#) that we introduced at M&M last month. Features include:

- Touch screen operation
- Pre-recorded recipes for standard solution applications: RoHS, Metals



Check out the [flipbook](#) on our SEM webpage.

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Featured Videos



[CryoSEM with JEOL Field Emission SEM and Quorum](#)



[3View Serial Block Face Imaging](#)

Product Spotlight



[A New Look at JEOL NMR Systems](#)

(Air/Vacuum *), Oxides (Air/Vacuum *), Organic Materials (Air/Vacuum*)

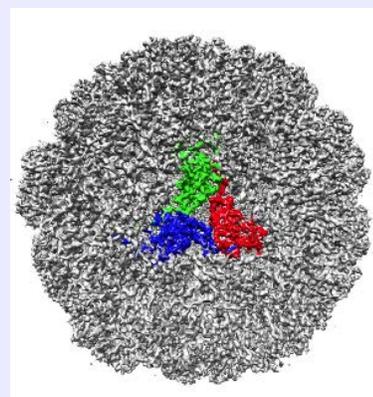
- High-sensitivity SDD and short-path optical system for high throughput analysis
- Advanced Fundamental Parameter (FP) methods for accurate quantification without standard samples.
- Residual balance and thickness correction for organic samples

Visit the [website](#) for more information and for access to a series of applications notes, then let us know if we can answer any questions.

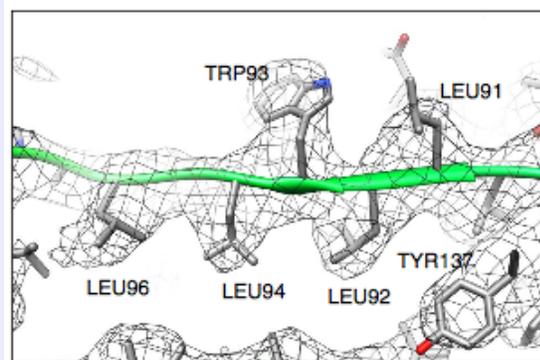
We'll have this new EDXRF on display at [MS&T \(Pittsburgh, Oct 14 & 15\)](#) and [ISTFA \(Houston, Nov 11-14 booth #213\)](#).

Advances in Cryo-TEM: Atomic Structure of ssRNA Virus

[Dr. Wah Chiu](#) and colleagues at the National Center for Macromolecular Imaging of Baylor College of Medicine (Houston, Tx) have published a rigorously validated atomic structure of brome mosaic virus (BMV), a small ssRNA virus. The paper was released on 4 September 2014 in Nature Communications. The article shows that at 3.8Å resolution and using the appropriate de novo methods, a rigorously validated structure can be obtained that rivals structures obtained by X-ray at much higher resolution. Thus, the article demonstrates that

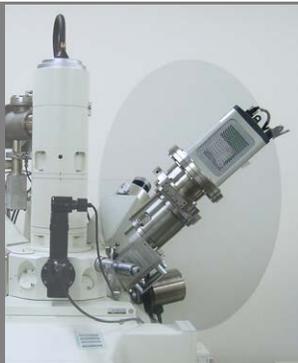


"advances in electron cryo-microscopy have enabled structure determination of macromolecules at near-atomic resolution". The article details a complete workflow including data acquisition, processing and validation. Images were acquired using a DE-12 Direct Detection Device camera (Direct Electron LP, San Diego, U.S.A.) operated in movie mode interfaced to a 300 kV JEM-3200FSC (JEOL Ltd, Akishima, Japan) transmission electron cryo-microscope. The open-access paper is available [here >>>](#).



State University of New York (Albany) Musah Research Lab

Solving chemical mysteries and developing faster methods for analysis are all part of the work that goes on at JEOL USA's mass



Soft X-Ray Emission Spectrometer for Microprobe



Professor Rabi Musah with Ph.D. candidates Justine Giffen and Ashton Lesiak.

spectrometry demonstration lab, but it's not only by JEOL scientists. For a week in July 2014, the demo lab resembled a greenhouse. [Professor Rabi Musah](#) and two Ph.D. students from the State University of New York (Albany) visited JEOL to use the [AccuTOF-DART mass spectrometer](#) as part of a National Science Foundation (NSF)-funded study of the environmental impact of plant small molecule emissions.

[More>>>](#)

Stephen Fuller (1953-2014)



With the passing of Prof. Stephen Fuller in August, the microscopy community has lost a key figure in the development and early application of cryo-em and computational image processing methods, especially in the understanding of viruses. His work on Semliki Forest Virus represented a major advance in the development and use of icosahedral reconstruction methods to determine virus protein structure from cryo-EM images. Among his other major contributions are a series of important papers on retroviral structure and assembly, an early study of centriole structure, and a tomography study of the immune synapse. He was Professor of Macromolecular Structure and Assembly at Oxford University before his career was cut short by illness. He was awarded the Ruska prize in 2000, gave the Ernst Abbe lecture in 2002, and was elected an EMBO member in 2008. Stephen's colleagues and friends knew him as an inspiring mentor and an extraordinarily kind and generous person.

Thank you for subscribing and for your interest in JEOL. Contact us at jeolink@jeol.com with any comments, questions, or input for the JEOLink newsletter.

Sincerely,

JEOL USA

JEOL

Solutions for Innovation



Visit our Facebook page, Twitter, or LinkedIn to see regular updates from JEOL. Click [here](#) to see photos from the International Microscopy Conference (IMC 2014) in Prague last month.



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