

SEM | TEM | MASS SPEC | NMR | ESR | EPMA | AUGER | FIB | SAMPLE PREP | APPLICATIONS EXPERTISE

# JEOLink Newsletter

JUNE 2018 | ISSUE #79



## Grand Opening! UC Irvine Materials Research Institute (IMRI) - JEOL Center for Nanoscale Solutions - 1st Int'l Symposium on Advanced Microscopy & Spectroscopy (ISAMS)



The [list of speakers](#) read like a who's who in materials science and *in situ* EM. The [three-day event](#) kicked off on June 6 with a welcome from [Dr. Xiaoqing Pan](#), Director of the [University of California Irvine Materials Research Institute \(IMRI\)](#), and was hosted in the auditorium and atrium of a bright and airy building on the UC Irvine campus. The next morning, highlights included the ribbon cutting ceremony, tours of the labs in the IMRI, and more presentations on research advancements followed.

[Photos from the event are compiled in a brief slideshow.](#)

The JEOL Center for Nanoscale Solutions at IMRI is poised to become one of the world's preeminent centers of excellence for interdisciplinary research, discovery and development of engineered and natural materials, systems and devices. IMRI is home to several of the highest performance TEMs available in the world today. It is also the first US installation of the JEOL [GRAND ARM Transmission Electron Microscope](#) developed for advanced atomic resolution characterization. In addition, the facility also houses the [JEM-2800 high throughput, nano-analysis TEM/STEM](#), and the JEM-2100F cryogenic and atomic level structural analysis TEM.

"We look forward to many years of a partnership with IMRI in the hope that the JEOL Center for NanoScale Solutions will benefit the scientific community and provide much success to all who endeavor to achieve something radically new. TEM technology has come a long way, and we at JEOL also stand to learn more from the work that will be done here at the IMRI to keep pace with the innovations and cutting-edge research that will bring us into the next generation of scientific discoveries," JEOL USA President Peter Genovese said in his speech during the Ribbon Cutting Ceremony.

[Read more from UCI here.](#)

## JEOL Image Contest 2018

Congratulations to our Image Contest winners for April and May!

**Twins in Magnesium** - April 2018

**Submitted by Lawrence Whitmore of University of Salzburg.**

Atomic arrangement across a twin boundary in magnesium. Image was taken at 200 keV with the electron beam parallel to the specimen [100] lattice vector using JEM-F200 TEM and high resolution lattice imaging.

**Axon Rose** - May 2018

**Submitted by Lita Duraine of Howard Hughes Medical Institute.**

The image is a representation from genotype VPS11 from drosophila brain tissue. VPS11 is one of many Vacuolar Protein Sorting genes that we studied in our lab. The image shows a mutant axon gone awry amongst other brain cells. Drosophila heads were fixed in Modified Karnovsk's fix, osmicated, dehydrated in graded ethanols, and embedded in Embed 812. Tissue was cut on a Leica EM UC7 Ultramicrotome. Imaged on a JEM-1400Plus TEM.



## Do you have a great image to share? Enter the JEOL 2018 Microscopy Image Contest!

Visit our website for how to [enter the contest](#) and win an Amazon gift certificate and be featured in the next JEOL calendar! View all [entries](#) or learn more about criteria for a winning image. [See all the 2018 entries to date here.](#)

## What's New for M&M 2018? See us in Baltimore!

Step into JEOL's Electron Microscopy World at M&M 2018 in Baltimore, August 6-9, 2018 and take a step up in high resolution imaging and analysis. Catch the excitement of the microscopy community's biggest event, watch a demonstration, visit with our microscopy experts, schedule a one-on-one overview of an SEM or TEM. Plus, take a few moments to find out about Mass Spec Imaging.

From [benchtop SEM](#) to [Atomic Resolution TEM](#), and now [MSImaging](#), we have solutions for all your microscopy needs. Check out our full lineup of [Scanning Electron Microscopes](#) and [Transmission Electron Microscopes](#), [Microprobes and Auger](#), as well as [Sample Preparation Tools](#) and [Focused Ion Beam](#).

[Schedule a demo on one of our SEMs or TEMs in booth #812 or arrange a time to meet with any of our representatives.](#)



Electron Microscopy Excellence

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## STEP INTO JEOL'S ELECTRON MICROSCOPY WORLD

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### Publications and Microscopy News

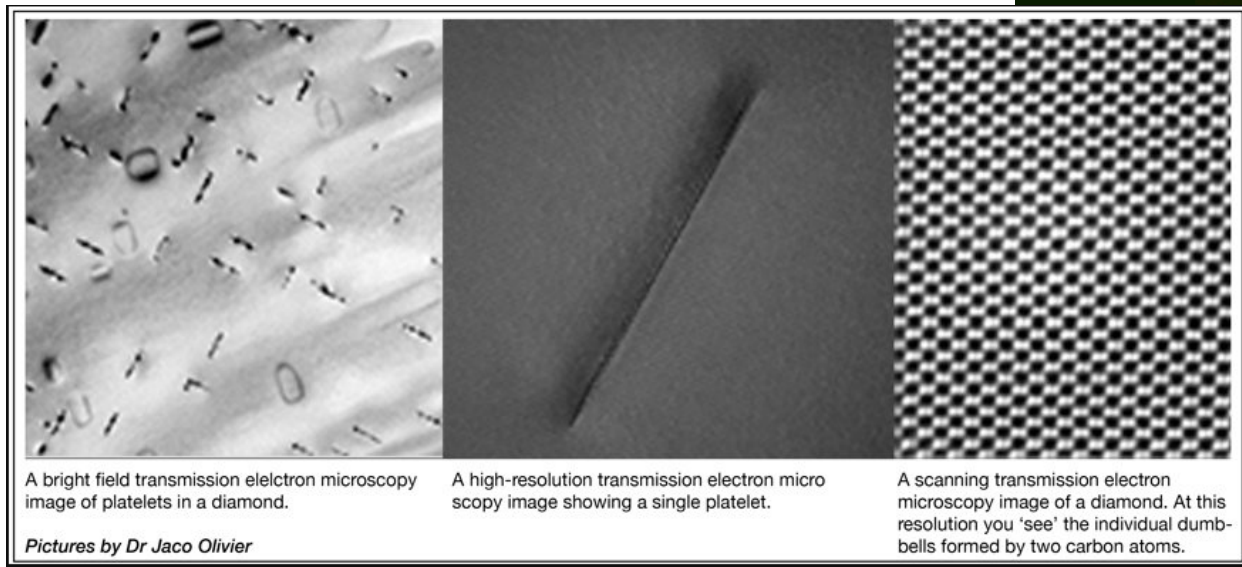
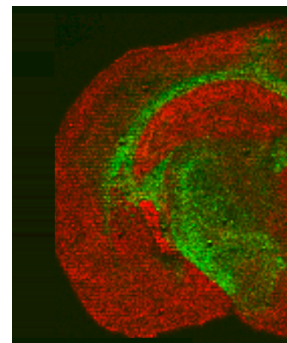
[Dreaming Big, Focusing Small](#) - Prof Stephen Pennycook has pushed scanning transmission electron microscopy to atomic limits and further.

[Particle Size Effect of Volcanic Ash towards Developing Engineered Portland Cements](#) - Promoting the use of naturally available materials as a partial substitute to portland cement can be a viable solution for producing low carbon footprint and durable cements. This work assessed the chemomechanical behavior of hardened cement pastes with partial replacement of ordinary portland cement (OPC) with volcanic ash up to 50%.

### [Imaging Mass Spec Applications](#)

The molecular makeup of a biological sample describes its structure and often unveils functional aspects, such as normal versus diseased. By scanning a sample with mass spectrometry (MS) and combining that information, scientists can explore the distribution of biomarkers, proteins, and other molecules, along with their masses. Thus imaging MS is essentially molecular microscopy.

## [Scientists Peep Deep into a Diamond to Discover its Defects](#)



A bright field transmission electron microscopy image of platelets in a diamond.

A high-resolution transmission electron microscopy image showing a single platelet.

A scanning transmission electron microscopy image of a diamond. At this resolution you 'see' the individual dumbbells formed by two carbon atoms.

*Pictures by Dr Jaco Olivier*

Using two processes, namely transmission electron microscopy and electron energy-loss spectroscopy, the scientists probed the spatial arrangement of carbon and nitrogen atoms forming the core of the defects. The nature of the bonds between the atoms was also determined.

**[With a Trace: Solving Crimes with Microscopy](#)** - Many applications of EM in forensics go beyond gunshot residue. For example, paint transferred between vehicles in a crash can be analyzed to unimaginable depths.

**[Pseudo-icosahedral Cr<sub>55</sub>Al<sub>23</sub>Zr<sub>2</sub>-5 as a high-temperature protective material](#)** - JEOL contributed to a paper in Physical Review Materials, a collaboration that researches suitability of pseudo-icosahedral Cr aluminide for high-temperature protective coatings using [FE SEM](#) and [Cross Section Polisher](#).

**[Measuring the Temperature of Two Dimensional Materials at the Atomic Level](#)** - Researchers at the University of Illinois at Chicago describe a new technique for precisely measuring the temperature and behavior of new two-dimensional materials that will allow engineers to design smaller and faster microprocessors. Their findings are [reported](#) in the journal *Physical Review Letters*.

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## See Us at These Upcoming Events

### [UGIM Symposium \(University Government Industry Micro/Nano Technology Symposium\) \\* GOLD Sponsor](#)

June 24-27, 2018  
University of Pennsylvania - Philadelphia, PA

### [Semicon West](#)

July 10-12, 2018  
Booth #6064  
San Francisco, California

### [Microscopy & Microanalysis](#)

August 6-9, 2018  
Booth #812  
Baltimore, Maryland

Stay tuned for more news about the Grand Opening at the Singh Center for Nanotechnology, University of Pennsylvania, on Friday, August 10th, following M&M 2018.

[Contact us for a demo or to meet with a representative at any of our events.](#)

Full 2018 [Calendar of Events](#)

### ANNOUNCING THE SELFIE CONTEST WINNERS!

Thanks to all who entered the contest far and wide, with all sorts of JEOL instrumentation. Congratulations to our winners! [Descriptions of the winning images are on our website.](#)



#### Connect with JEOL

Stay in touch with us at JEOL USA and share in the fun and some valuable information. Besides, we like to see you there!



Contact us at [jeolink@jeol.com](mailto:jeolink@jeol.com).

Our 2018 [Calendar of Events](#) is now online. See us at these upcoming conferences and meetings!

Click one of the icons below to learn more about JEOL products.



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