

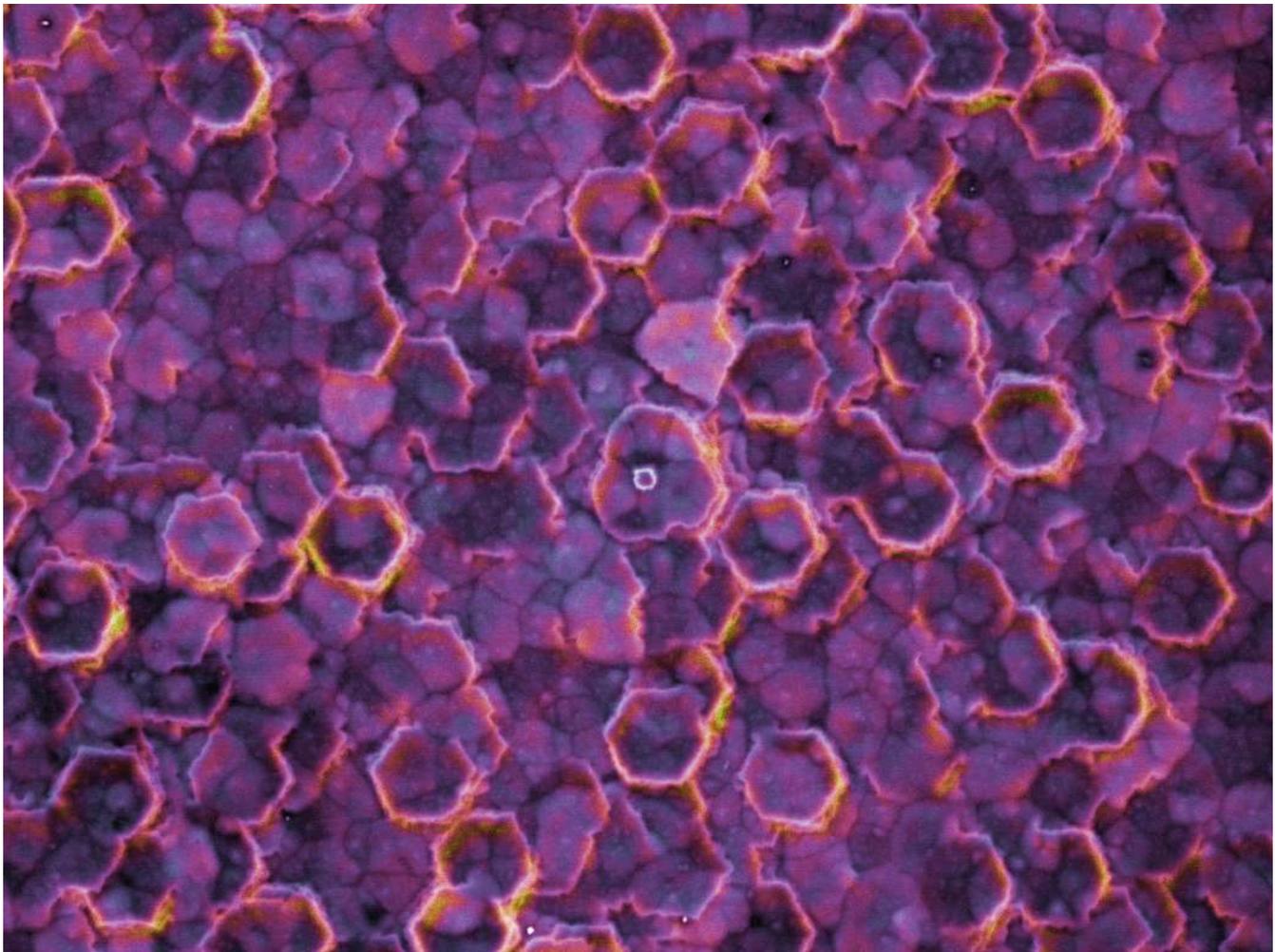
## JEOL Image Contest 2018 - July and August Winners

### Ultraviolet Lace

**Lucia Spasevski, University of Strathclyde**

Surface morphology of AlGaN semiconductor material. Overlay of a backscattered electron image with a CL image revealing light emission properties.

JXA-8530F EPMA



### Hi There!

**Stefan Eberhard, Complex Carbohydrate Research Center, University of Georgia.**

Ant head.

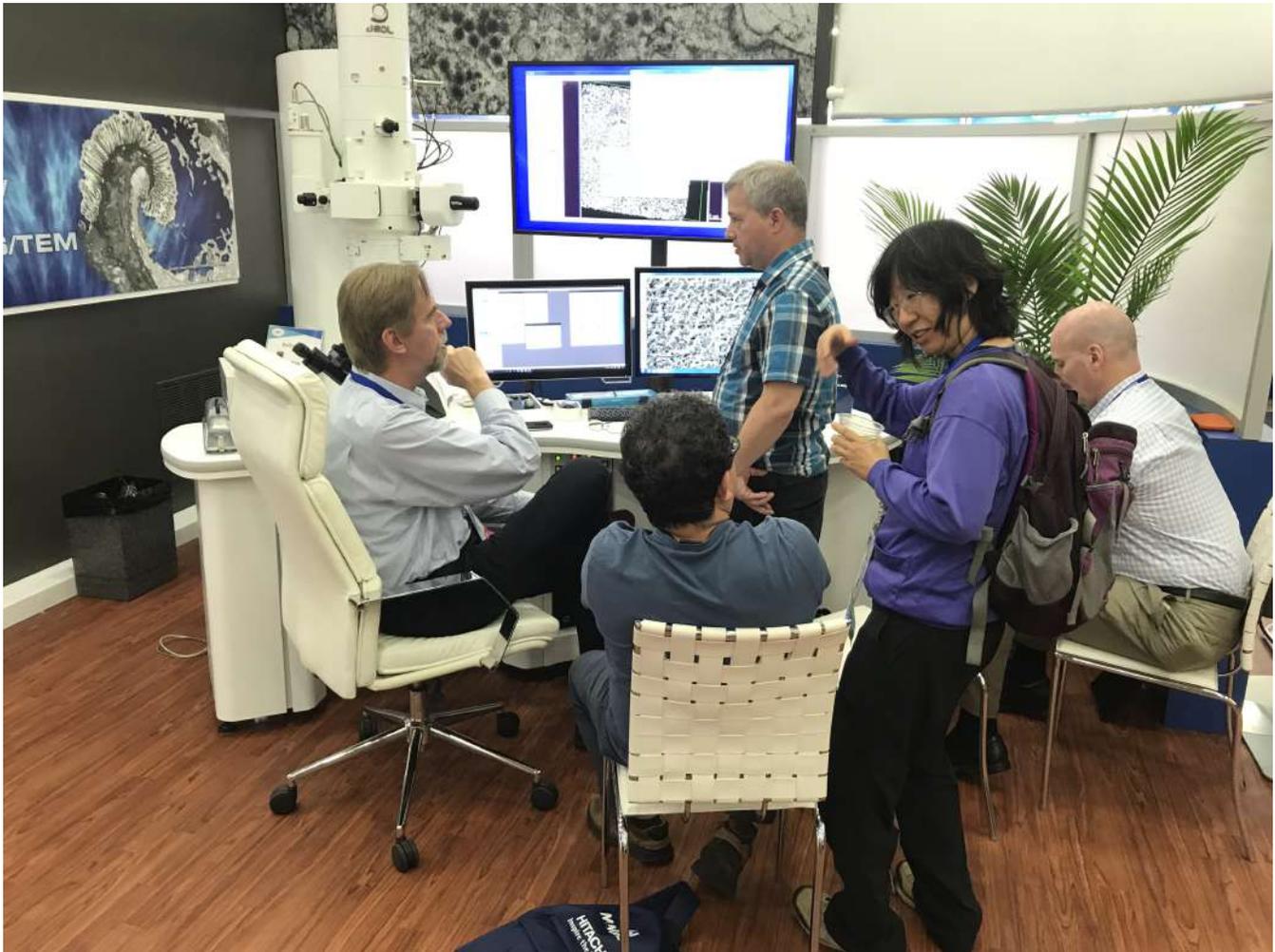
JSM-6010 LV SEM.

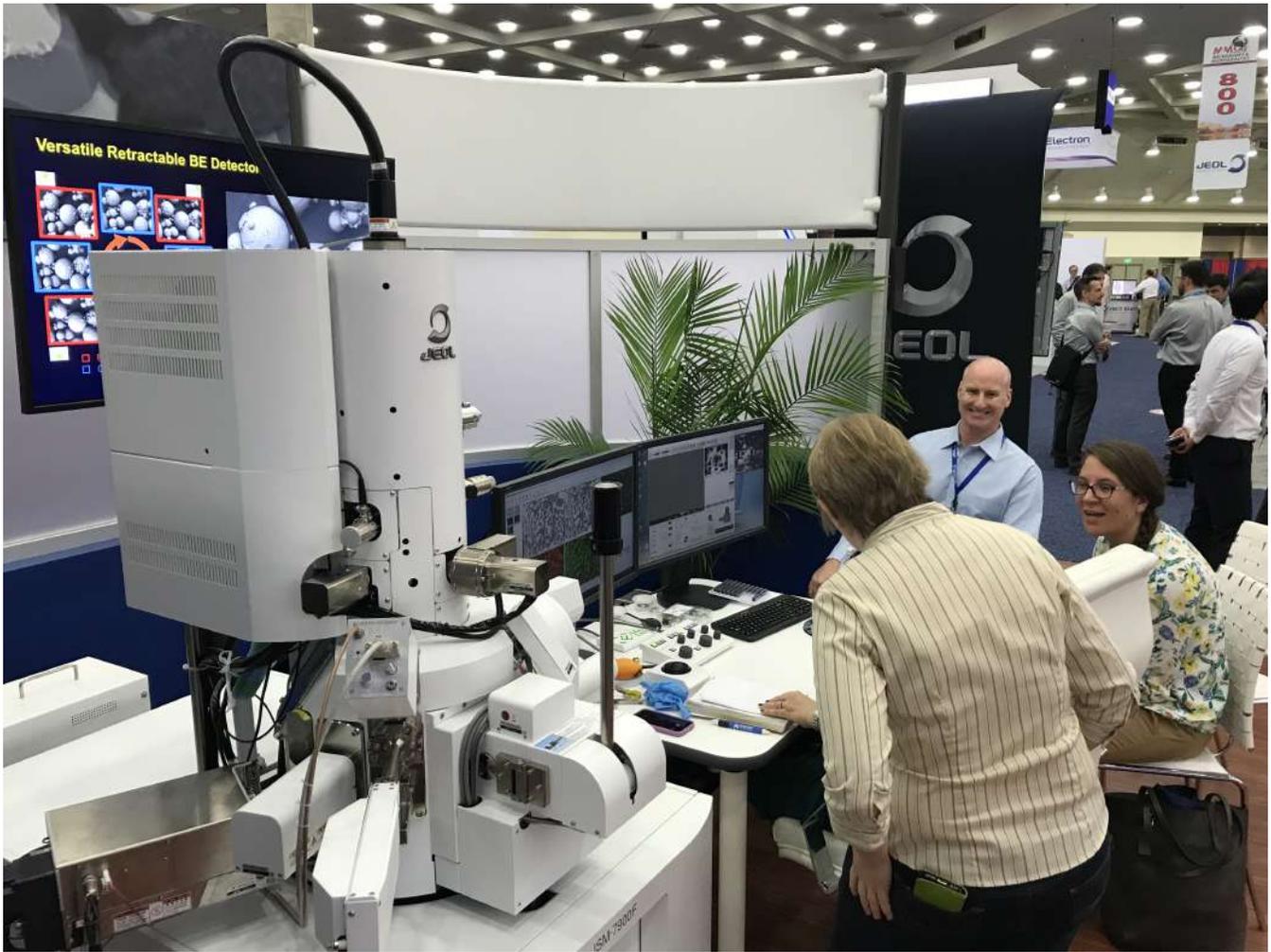
## Do you have a great image to share? Enter the JEOL 2018 Microscopy Image Contest!

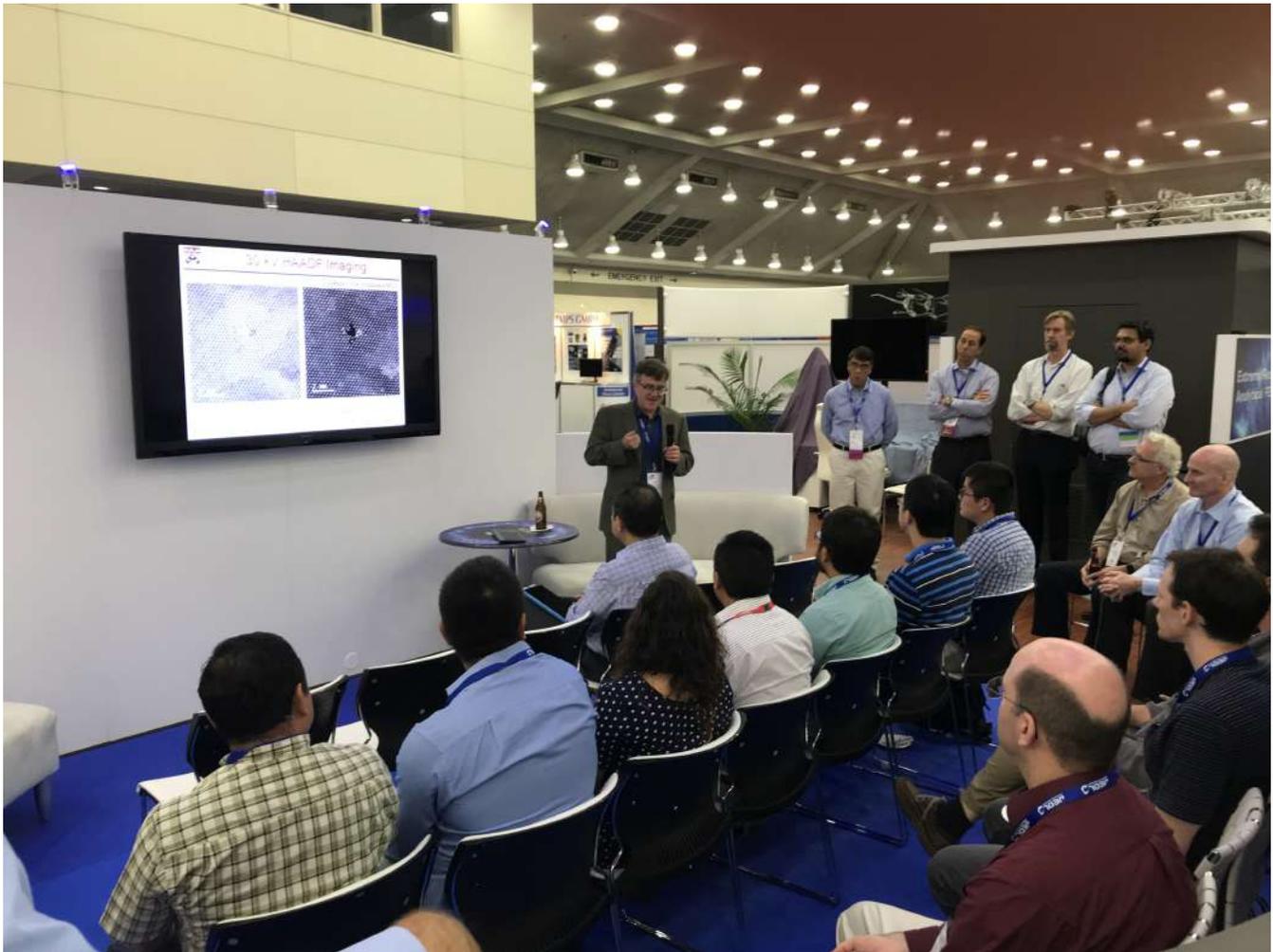
Will you be our next Image Contest Winner - for September and October? Or a Grand Prize Winner for 2018?

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.](#)

## M&M 2018 Baltimore







The microscopy community's biggest event of the year is in the past now, but what a great event it was. Check out our [YouTube slide show](#) to see more.

We thank all who came to our booth to say hello and especially those who took the time to tell us how much they like their JEOL microscopes and the service and support from JEOL - you made our day! Thanks to all who came to look at the latest microscopes, see a demo, or attend one of our after-hours tutorials. And a special thanks to our presenters at the tutorials, Cindi Schwartz of Rocky Mountain Labs, Eric Stach of University of Pennsylvania Singh Center for Nanotechnology, and our own Chip Cody of JEOL.

If you weren't at M&M 2018, or would just like to see our latest product offerings, visit our website or [click here to view the latest JEOL lineup.](#)

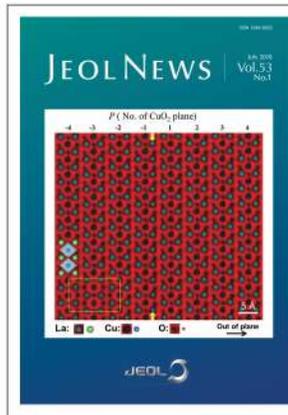


Congratulations to Vern Robertson, recipient of the Microanalysis Society (MAS) Presidential Service Award! Vern is EPMA/Surface Analysis Product Manager and SEM Technical Sales Manager, and has been with JEOL for 32 years. Masashi Watanabe (MAS President) presented the award during M&M 2018 in Baltimore.

JEOL News Vol 53 was distributed at M&M. The cover image credit goes to Yi Wang of the Stuttgart Ctr for Electron Microscopy, Max Planck Inst. - who stopped by our booth. The publication (and archived issues) [can be viewed online here](#) or contact us for a copy to be mailed to you (email us at [jeolink@jeol.com](mailto:jeolink@jeol.com)).



In August, following M&M, the Singh Center for Nanotechnology held a microscope dedication ceremony and offered a full day of talks by experts in the field of atomic resolution TEM. Two JEOL TEMs were unveiled for use by the university and researchers. Learn more in the U Penn article [New Microscopes Will Allow Researchers to See Small and Think Big.](#)

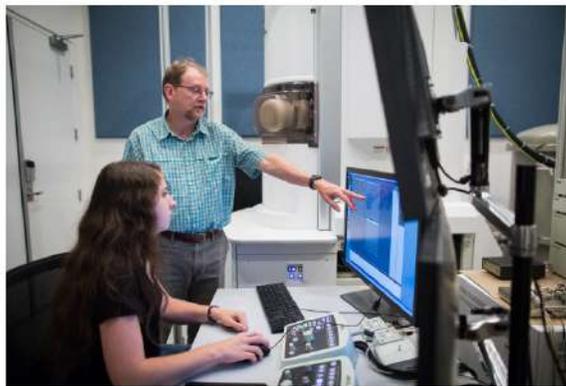


- Fast Pixelated Detectors: A New Era for STEM
- Aberration-Corrected Scanning Transmission Electron Microscopy of La<sub>2</sub>CuO<sub>4</sub>-based Superconducting Interfaces at the Stuttgart Center for Electron Microscopy
- Technical Development of Electron Cryomicroscopy and Contributions to Life Sciences
- Electronic State Analysis by Monochromated STEM-EELS
- Chemical State Analyses by Soft X-ray Emission Spectroscopy
- X-ray, Electron and NMR Crystallography to Structural Determination of Small Organic Molecules
- Structural Analysis of Semiconductor Devices by Using STEM/EDS Tomography
- Comparison of 3D Imaging Methods in Electron Microscopy for Biomaterials
- Biomarker Analysis in Petroleum Samples Using GC×GC-HRTOFMS with an Ion Source Combining Electron Ionization (EI) and Photo Ionization (PI)
- Development of the JBX-8100FS Electron Beam Lithography System



## New microscopes will allow researchers to see small and think big

Two high-resolution microscopes will allow researchers to study and test materials at the atomic level with unprecedented precision.



Penn's Singh Center for Nanotechnology now houses two high-resolution microscopes that will allow researchers at the University to examine materials at the atomic scale.

## Soft X-ray Emission Spectrometer Talk and Handbook

During the **Solid-State X-Ray Spectrometry at 50 Years** session at M&M, Dr. M Terauchi of Tohoku University gave a talk "Non-Uniform Distribution of Doped Carrier in a Na-Doped CaB<sub>6</sub> Bulk Material Observed by EPMA-SXES." Terauchi and JEOL have compiled a new handbook of Soft X-ray Emission Spectra [available for download](#).

The JEOL [Soft X-ray Emission Spectrometer \(SXES\)](#) features both high spectral resolution (0.3eV), which allows for the Nitrogen K $\alpha$  and Titanium L $\beta$  line to be separated, and ultra-low energy, low-concentration sensitivity. It has the ability to detect Li even at low single digit weight percent concentration. An additional, and maybe its strongest asset, is its ability to do chemical state analysis. The spectrometer detects differences between conduction band and valence band electrons when they emit X-rays allowing the distinction between bonding and crystal structure in samples containing the same elements. An example would be differentiating highly ordered pyrolytic graphite vs. diamond, both of which are made only of carbon.

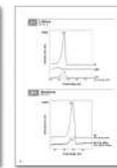


### Handbook of Soft X-ray Emission Spectra

Version 4.0 (Aug. 2018)

Masami Terauchi<sup>1)</sup>, Hiroyuki Takahashi<sup>2)</sup>, Masaru Takakura<sup>3)</sup> and Takahiro Murano<sup>1)</sup>  
IMRAM, Tohoku University<sup>1)</sup> and JEOL Ltd.<sup>2)</sup>

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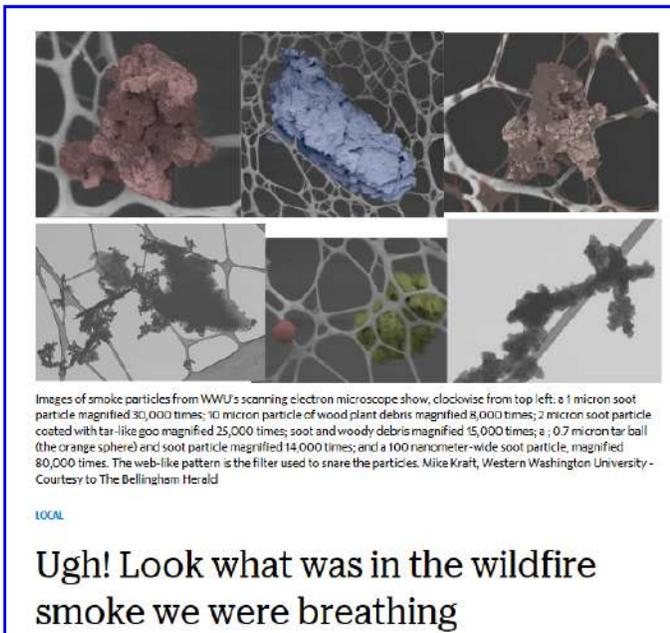
No. 20180278 Printed in Japan, KJ

## Publications and Microscopy News



### [Cutting Edge Electron Microscope Revealed at Opening of New Structural Biology Center](#)

The **University of Glasgow** has opened an innovative new structural biology centre, home to a cutting-edge electron microscope - the first of its kind in Scotland - that will be used to image biological molecules at the atomic level.



### [A Western Washington University researcher shares SEM images of wildfire smoke particles.](#)

### [Geology team researches Scandinavian mountain mystery.](#)

Cornell College geology students spent the summer using microprobe to help understand how mountain belts form and how continents collide.

### [Particle Size Effect of Volcanic Ash towards Developing Engineered Portland Cements](#)

New paper from MIT researcher shows that up to 50% percent of portland cement in concrete can be replaced with fly ash, reducing fuel consumption, greenhouse gases, and hazardous waste.

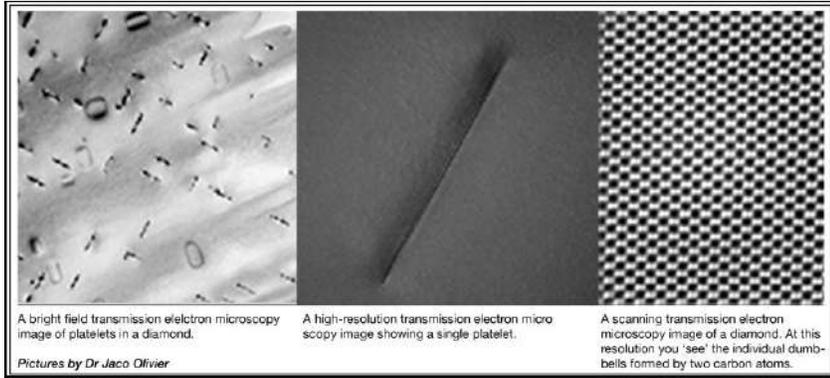
[Dreaming Big, Focusing Small](#) - Prof Stephen Pennycook has pushed scanning transmission electron microscopy to atomic limits and further.

### [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](#)



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>232-δ</sub> 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

### [Cornell Nanoscale Facility Annual Meeting](#)

Thu Oct 04, 2018

Ithaca, NY

Event Web Site: <http://go.jeolusa.com/e/234012/cnf-2018am-html/5zxf8/198723185?h=eBpBZ2cO3s-0I5knCRgo4r-fcb3WqXRF2IPTpSGNP6I> [ [GO](#) ]

### [Appalachian Regional Microscopy Society \(AReMS\)](#)

Thu Oct 04, 2018 - Fri Oct 05, 2018

Knoxville, TN

Location: <http://go.jeolusa.com/e/234012/fall-meeting-info/5zxf8/198723185?h=eBpBZ2cO3s-0I5knCRgo4r-fcb3WqXRF2IPTpSGNP6I> [ [GO](#) ]

### [In situ TEM and EBSD Workshop](#)

Thu Oct 04, 2018

Location: Fort Collins, CO

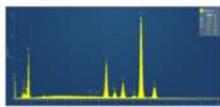
Event Web Site: <http://go.jeolusa.com/e/234012/2oW4xGz/5zxf8/198723185?h=eBpBZ2cO3s-0I5knCRgo4r-fcb3WqXRF2IPTpSGNP6I> [ [GO](#) ]

## ADVANCED ENERGY DISPERSIVE SPECTROSCOPY (EDS) FOR MATERIALS ANALYSIS

October 2-3, 2018

Chemistry Department, Colorado State University, Fort Collins, CO

**TWO DAY SHORT COURSE**, with lectures and hands-on labs, will cover qualitative and quantitative energy dispersive spectroscopy in both TEM and SEM plus an introduction to DTSA-II.



### Lecturers

- Dale Newbury (NIST)
- Masashi Watanabe (Lehigh University)

### Topics

- Qualitative EDS in the SEM and TEM
- Quantitative EDS in the SEM and TEM
- How to use Standards in EDS in both SEM and TEM
- Using DTSA-II to analyze data

### Instrumentation

- JEOL JSM-7200F VP FEG SEM and JEOL JEM-2100F S(TEM)
- Oxford XMax 80, UltimMax 170 SDD EDS and Symmetry EBSD

### Registration Fees

Students: \$200  
Non-Students: \$300

Register by Sept 1, 2018. Check schedule updates at the site below.

The Short Course will be followed by a **free one day workshop on Oct 4**, with lectures and demos covering both in-situ experiments using the **Protochips Fusion heating sample holder** in the TEM and "Chemistry and Crystallography" with EDS and EBSD, using the **Oxford UltimMax 170 EDS** and new **Symmetry EBSD** in the SEM.

[cif.colostate.edu](http://cif.colostate.edu)



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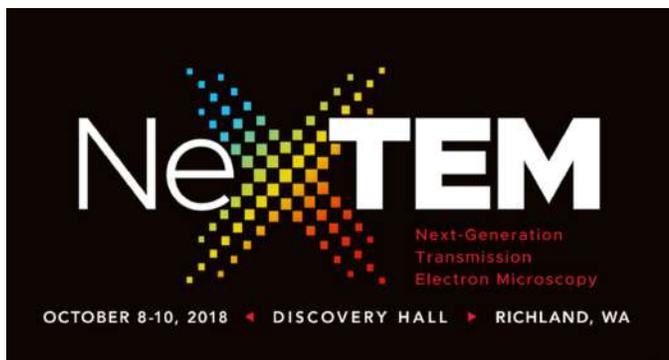
### NexTEM Workshop

Mon Oct 08, 2018 - Wed Oct 10, 2018

Location: Pacific Northwest National Laboratory - Richland, WA

Event Web Site: <http://go.jeolusa.com/e/234012/756054996840a2b7878abd899-asp/5zkgf/198723185?h=eBpBZ2cO3s-015knCRgo4r-fcb3WqXRF2IPTpSGNP6I> [ [GO](#) ]

Corporate Sponsor



### Materials Science & Technology (MS&T)

Mon Oct 15, 2018 - Wed Oct 17, 2018

Location: Columbus, OH

Event Web Site: <http://go.jeolusa.com/e/234012/2018-09-27/5zkgf/198723185?h=eBpBZ2cO3s-015knCRgo4r-fcb3WqXRF2IPTpSGNP6I> [ [GO](#) ]

### IX National Congress of Crystallography, XII National Congress of Microscopy and VIII Meeting of Users of Synchrotron Light (RedTULS-8)

Sat Oct 20, 2018 - Thu Oct 25, 2018

Booth #10

Location: Oaxaca, México

Event Web Site: <http://go.jeolusa.com/e/234012/2018-09-27/5zkgf/198723185?h=eBpBZ2cO3s-015knCRgo4r-fcb3WqXRF2IPTpSGNP6I> [ [GO](#) ]

### Northeastern Association of Forensic Scientists (NEAFS)

Thu Oct 25, 2018 - Fri Oct 26, 2018

Location: Bolton Landing, NY

Event Web Site: <http://go.jeolusa.com/e/234012/neafs-annual-meetings/5zkgf/198723185?h=eBpBZ2cO3s-015knCRgo4r-fcb3WqXRF2IPTpSGNP6I> [ [GO](#) ]

### MMMS Michigan Microscopy & Microanalysis Society 2018 Meeting

Thu Nov 1, 2018

Talk: Advances in Low kV Imaging and Microanalysis presented by Vern Robertson

Web Site: <http://go.jeolusa.com/e/234012/2018-09-27/5zkgf/198723185?h=eBpBZ2cO3s-015knCRgo4r-fcb3WqXRF2IPTpSGNP6I> [ [GO](#) ]

### International Symposium for Testing and Failure Analysis (ISTFA)

Tue Oct 30, 2018 - Wed Oct 31, 2018

Booth #607

Location: Phoenix, AZ

Event Web Site: <http://go.jeolusa.com/e/234012/web-istfa-2018/5zkfs/198723185?h=eBpBZ2cO3s-0I5knCRgo4r-fcb3WqXRF2IPTpSGNP6I> [ [GO](#) ]

#### [Society for Neuroscience](#)

Sat Nov 03, 2018 - Wed Nov 07, 2018

Booth #3001

Location: San Diego, CA

Event Web Site: <http://go.jeolusa.com/e/234012/Meetings-Neuroscience-2018/5zkfv/198723185?h=eBpBZ2cO3s-0I5knCRgo4r-fcb3WqXRF2IPTpSGNP6I> [ [GO](#) ]

#### [AAPS PharmSci 360](#)

Sun Nov 04, 2018 - Wed Nov 07, 2018

Booth #2718

Location: Washington, D.C.

Event Web Site: <http://go.jeolusa.com/e/234012/aaps-pharmsci-annual-meeting/5zkfx/198723185?h=eBpBZ2cO3s-0I5knCRgo4r-fcb3WqXRF2IPTpSGNP6I> [ [GO](#) ]

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

## Past Events

[MIT NanoTool Talk](#) held September 18th at Massachusetts Institute of Technology - our speakers included Patrick Philips, Vern Robertson, Tom Isabell of JEOL, Rabi Musah and Kristin Fowble of SUNY Albany.

[IMC '19 - 19th International Microscopy Congress - September 9-14, 2018 - Sydney, Australia](#)



## Full 2018 [Calendar of Events](#)

### 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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