

JEOL 2017 Image Contest - Fall colors take the prize



Congratulations to [Sheri Neva](#) at EAG Laboratories in California for yet another winning image. Sheri combines art and science in a unique way in her SEM images, and in this case, she says, "I did an alcohol painting on translucent paper. Then scanned the painting to make it digital and overlaid the painting in Photoshop." The image was taken with a JSM-6610LV SEM. She also recently won three awards at the [ASM International 2017 International Metallographic Society Contest!](#)

Congratulations to [Anette von der Handt at University of Minnesota](#) for her beautiful EPMA image taken on an older model microprobe, the JXA-8900R. "The sample is a polished high-pressure experimental capsule. The picture shows different textures of an experiment that was run at a pressure of 6 GPa and a temperature 1400 °C, which produced a solid assemblage of olivine plus garnet as well as a quenched carbonated silicate melt. Solid phases quenched from the liquid include carbonates and olivine (the bladed crystals). The experiment was carried out by Jed Mosenfolder here at UMN as part of a study to investigate water storage in the deep Earth's mantle. While almost all of the minerals in the Earth's mantle are anhydrous, they can contain very small amounts (ppb to ppm) amounts of water. Because the mass of rock in the mantle is so large relative to ocean mass, the amount that is incorporated in the nominally anhydrous phases of the interior may constitute the largest reservoir of water in the planet."

**Do you have a great image to share?
Enter the JEOL 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.

Pre-order your 2018 JEOL Image Contest Calendar

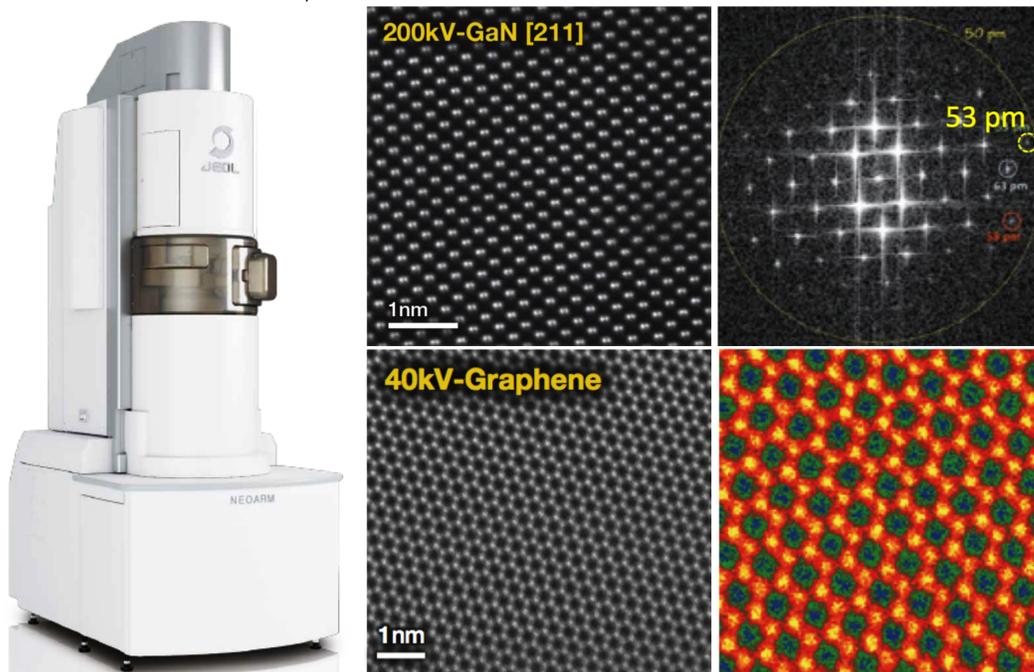
This will be our 4th calendar featuring the winning images selected each month of the calendar year. Order ahead so you'll be sure to receive a copy. [Click here to order.](#)

Advanced Aberration-Corrected STEM: Low kV and High Speed

Patrick J Phillips, JEOL USA

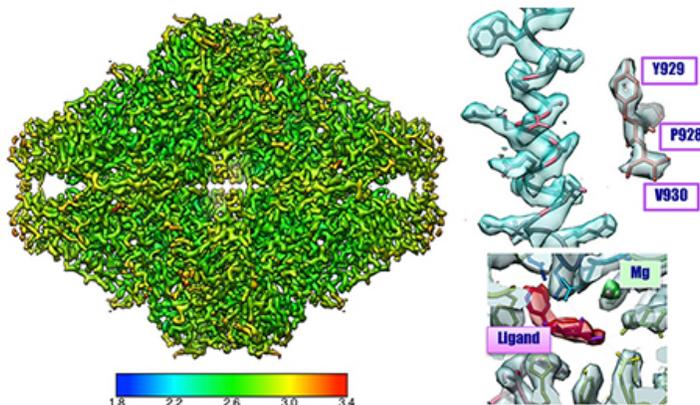


Aberration-corrected scanning transmission electron microscopy (STEM) continues to play an essential role in the analysis of a multitude of relevant materials systems. By combining high-resolution imaging, X-ray and electron energy loss spectroscopy, and fine structure analysis, one can fully characterize a material's structure, chemical composition, and electronic properties. The present contribution will focus on the latest aberration-corrected STEM instrument from JEOL, the 30–200 kV NEOARM, while discussing both low voltage and high speed applications. For example, the acquisition of atomic-resolution STEM images at 30 kV, while simultaneously retaining the ability to perform both chemical and electronic fine structure analysis.



On November 1st, our TEM and materials applications expert Patrick Phillips was a presenter at Michigan Microscopy and Microanalysis Society's annual meeting. His topic was advanced aberration-corrected STEM, low kV, and high speed imaging and analysis. Learn more about the newest atomic resolution TEM in our lineup, the [NEOARM](#).

Cryo-EM: Unveiling Protein Functions from their Structures



Cryo-electron microscopy unveils the mysteries of life by investigating various molecular structures - [interview with Professor Keiichi Namba](#), Osaka University. Learn more about the JEOL [CRYOARM 200](#) and [CRYOARM 300](#).

In Celebration of the 2017 Nobel Prize in Chemistry

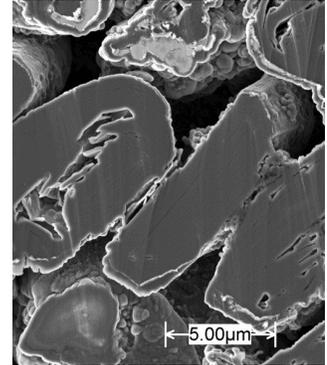
We are immensely pleased for the winners of the 2017 Nobel Prize in Chemistry! Congratulations to Dr. Jacques Dubochet (Professor, University of Lausanne, Switzerland), Dr. Joachim Frank (Professor, Columbia University, the U.S.A), and Dr. Richard Henderson (Program Leader, MRC, Laboratory of Molecular Biology, U.K.), for their development of Cryo-Electron Microscopy. [Read more about the development of cryo-electron microscopy.](#)

Lithium Ion Batteries

The basic structure of Lithium Ion Batteries consists of cathode material, separators, anode materials, and electrolyte. These various components are in the form of powders, sheets, and fluids. These materials require assessment before and after assembly and after repeating charge/discharge operations.

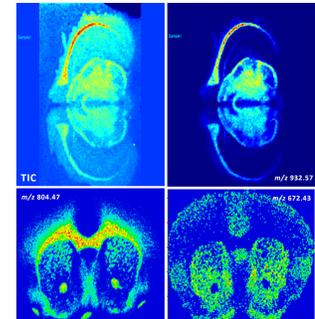
Visit our [Energy and LiB applications page](#) for more information. Learn how JEOL addresses the special requirements of LiB R&D with SEM, TEM, sample prep, NMR, and more in our [comprehensive applications note](#).

Air-isolation is critical for Lithium Ion Battery imaging and analysis with the SEM. This negative electrode material was prepared using the JEOL [air-isolated cryo cross-section polisher](#).



MALDI Imaging

Have you heard about the JEOL [MALDI Imaging SpiralTOF](#) - a powerful mass spectrometer that images of biological and organic samples? [See the new applications note](#) for examples of MALDI imaging with the SpiralTOF.



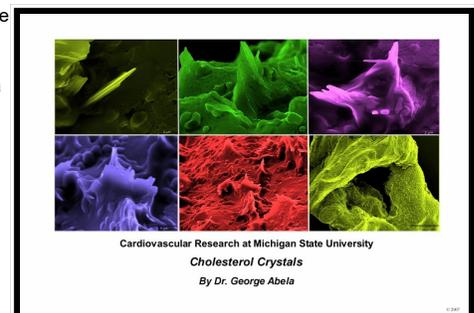
Platinum Takes a Bow

Cian McKeown has submitted 3 images this year to our image contest. They are all of platinum nanostructures taking on some interesting shapes! So we asked the PhD candidate at the University of Limerick to tell us about his work with platinum. [Read our recent blog post](#) to learn more. Do you have an interesting story to share? Let us know and we may feature you in our next blog! Contact us at jeolink@jeol.com.

In case you missed it: Cholesterol Crystals and Heart Attacks

At **Michigan State University's Department of Medicine**, Chief Cardiologist [Dr. George Abela](#) has made life-changing discoveries in understanding the role of cholesterol crystals in heart attacks. His use of unique fixation techniques and scanning electron microscopy have aided his research, revealing that the crystals form from fat, calcium, and other substances that expand in volume when going from a liquid to a solid state.

Images and full article [here>>>](#)



Experience the IT500HR - Exceptional Fidelity at Any kV and Seamless Operation with ZeroMag

This game-changing SEM delivers high-resolution Field Emission SEM performance with the ease of operation you've come to know with our Tungsten SEMs. [Learn more about the IT500HR](#), our newest SEM designed for seamless transition from optical to high resolution, high magnification image, and elemental analysis. [Watch sample imaging and analysis here](#). Visit our website to [learn more details](#).

Recent Publications and Microscopy News

[Electron Microscopy Unlocks the Answers to the Toughest Ceramics Questions](#) - Ceramics Expo News

[Understanding the Effects of a High Surface Area Nanostructured Indium Tin Oxide Electrode on Organic Solar Cell Performance](#)
- The newly installed ARM S/TEM University of Alberta NanoFAB was used to characterize Organic Solar Cell materials.

[Direct Detection Electron Energy-Loss Spectroscopy: A Method to Push the Limits of Resolution and Sensitivity](#) Direct detection technology has previously been utilized, with great success, for imaging and diffraction, but potential advantages for spectroscopy remain unexplored. Here we compare the performance of a direct detection sensor operated in counting mode and an indirect detection sensor (scintillator/fiber-optic/CCD) for electron energy-loss spectroscopy. [Dr. Mitra Tahiri](#) of Drexel University, co-author, explained that this was a grassroots effort - the authors co-developed the instrumentation with the aid of a special development grant from NSF. They are open to collaborators who wish to work with them using the instrumentation. This work was done using a JEM-2100F Transmission Electron Microscope.

[Tiny "Supraballs" Put a New Spin on Long-lasting Color](#)

Paper: *Bioinspired bright noniridescent photonic melanin supraballs*, Ming Xiao, et al.

[Ancient Canadian Meteor Strike Created Hottest Rock on Earth](#)

Paper: *Cubic zirconia in >2370 °C impact melt records Earth's hottest crust*, Timms, Erickson, Zanetti, et al.

Engineer Training at JEOL

In addition to customer training, we train both new and current service engineers. In October we enjoyed working closely with four new engineers hired recently from Michigan, California, Arkansas, and Texas. They were with us for three weeks before going back to their territories. Our long-time engineers from Mexico, Brazil, and Argentina were also here for TEM training for an extended period of time.

Connect with JEOL

See us at [MRS in Boston - November 28-30 - Booth #413](#)

Learn more about our recent innovations in Atomic Resolution TEM and Field Emission SEM for [materials](#).

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.

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