



Microscopy & Microanalysis 2010 in Portland, Oregon

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The Microscopy & Microanalysis Meeting (M&M) is the premier meeting for biological scientists, materials scientists, and nanotechnologists who use microscopy or microanalysis in their professional activities. Microscopy & Microanalysis 2010 will be no exception!

The meeting will feature over thirty symposia covering a wide range of microscopy topics. In recent years there has been special emphasis placed on fostering greater inclusiveness in the annual Microscopy & Microanalysis meetings. To encourage new attendees and the return of those who have become infrequent attendees, there are several areas of general interest for M&M 2010, including a renewed focus on scanning probe techniques with a strong emphasis on both biological and physical science applications. The thrust in scanned probe is anchored by our plenary opening presentation entitled “What Microscopy Can Tell Us about Alzheimer’s and Related Diseases,” which will be given by Professor Mark Welland of the Nanoscience Centre at the University of Cambridge in the UK. Professor Welland’s talk is also an excellent example of the kind of cross-disciplinary research that is becoming a focal point of the Microscopy & Microanalysis meeting. A related symposium, entitled “Microscopy Continues to Lead Advances in Alzheimer’s Disease,” expands the theme of neurological disease studies into many evolving microscopy methods: confocal, atomic force microscopy and its variations, Raman, multi-photon microscopy, mass spectrometry, and electron microprobe analysis.

An extensive surface science symposium will feature many techniques complementary to scanning probe microscopy, including Auger electron spectroscopy, x-ray photoelectron spectroscopy, and secondary ion mass



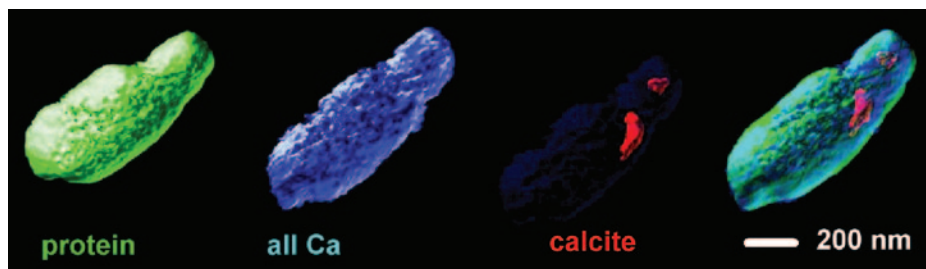
Professor Mark Welland, University of Cambridge, is plenary speaker for M&M 2010.

spectrometry. Secondary ion mass spectrometry, classically a technique limited to materials and geological sciences, has now become a popular and extremely powerful technique in chemical mapping of biological systems.

Several of the major symposia will cross over the traditional biological science, physical science, and analytical science borders. An outstanding example of this is the 3D electron microscopy “super-symposium” that has components in all three traditional areas yet promises to completely blur the boundaries between them. An example of the exciting new science in 3D microscopy can be seen in the work of invited speaker professor Adam Hitchcock from McMaster University in Hamilton, Ontario. Hitchcock’s invited presentation will focus on applications of the scanning transmission x-ray microscope (STXM), in particular, three-dimensional chemical mapping of the early stages of calcite mineralization in cyanobacterial cells, the formation of sulfur globules in anaerobic bacteria, and carbon imaging based on near edge x-ray absorption fine structure in fully hydrated cells.

Nobel Laureate George Palade’s pioneering work in determining the intricate inner workings of cells will be celebrated in a memorial symposium bearing his name. Professor Palade passed away in late 2008, and it is fitting that he and his inspiring research, which had a profound influence far beyond the walls of his laboratory, be remembered at this time. Colleagues of Palade from his time at Yale University, Philippe Male and Michael Caplan, will highlight his work and illustrate how it still has far-reaching effects on modern microscopy of the cell.

As energy awareness and sustainability have finally become truly global issues, Microscopy & Microanalysis continues to



Three-dimensional distributions of protein and Ca in a cyanobacteria undergoing calcite biomineralization determined by STXM spectro-tomography (Obst et al., *Geobiology* 7 (2009) 577).



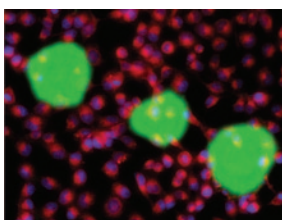
George Palade
(1912–2008)

feature symposia that focus on these important topics. This year the subjects are very diverse, including symposia entitled “Structural and Chemical Analysis of Materials in the Nuclear Power Industry” and “Nanoscale Characterization of Next Generation Photovoltaic Devices and Materials.”

We will again feature several symposia that emphasize microscopy and microanalysis of materials for nanotechnology. The focus will be on surfaces and interfaces with the

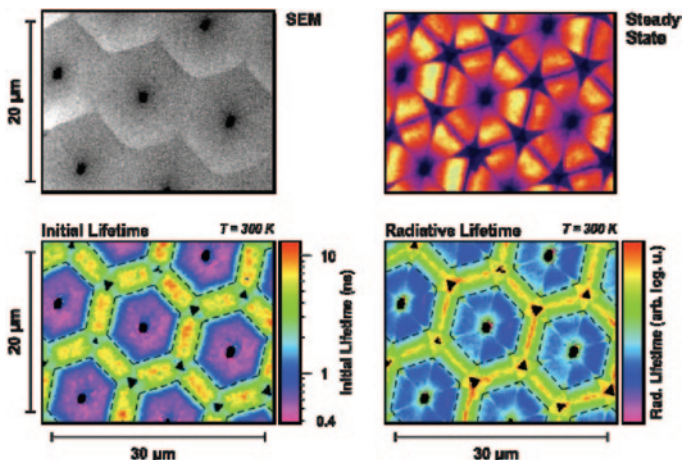
following symposia: “Imaging and Spectroscopy of Interfaces and Surfaces in Advanced Materials and Nanostructures,” “Particles, Pores, and Composites—Nano to Macro,” and “Probing the Properties of Nanomaterials with Microscopy,” an exploration of one-, two-, and three- dimensional nanostructures.

In “Microfluidic Devices: Emerging Platforms for Live Cell Microscopy”, Professor Shuichi Takayama’s presentation will feature his group’s work on nanolitre liquid patterning in aqueous environments, the goal being to deliver a reagent to a specific area in a cellular matrix.



Green-fluorescent dextran solution droplets patterned over red-fluorescent cells in polyethylene glycol solution. Image by Hossein Tavana (H Tavana, A Jovic, B Mosadegh, LQ Yi, X Liu, KE Luker, GD Luker, SJ Weiss, S Takayama, *Nature Materials* 8 (2009) 736–741).

Those who attend M&M to discover the latest cutting-edge developments in instrumentation and techniques will not be disappointed. There is an extensive symposium on the continued development of aberration corrected TEMs, entitled “Aberration-Corrected Electron Microscopy: Exploring Materials Through New Eyes.” In the symposium “TEM Phase Contrast Imaging in Biological and Materials Science,” Harald Rose will discuss the



Spatial and time-resolved cathodoluminescence images of InGaN/GaN semipolar quantum wells. Juergen Christen from Otto-von-Guericke-University Magdeburg, Germany.

SALVE project, which stands for Sub-Ångström Low-Voltage Transmission Electron Microscopy. This project seeks to develop a low-voltage (60–80 kV), fully corrected, phase-contrast TEM for atomic resolution imaging of low-Z elements, such as carbon. Also, there have been some compelling advances in the field of cathodoluminescence and this year’s symposium, “Scanning Cathodoluminescence Microscopy and Spectroscopy: New Developments and Applications” will feature professor Juergen Christen from Otto-von-Guericke-University in Magdeburg, Germany. His presentation will discuss picosecond time and nanometer spatial resolution cathodoluminescence spectroscopy mapping.

Perhaps you are interested in dynamic microscopy? The ultrafast EM symposium returns this year; however, the scope of the symposium has been broadened to include ultrafast events in materials science: “Ultrafast EM and the Effects of Ultrafast Events on the Structure and Chemistry of Materials.”

Remember, if you do not see your own particular research area in this article, we haven’t forgotten you! Check out the complete listing of all 34 symposia, 3 workshops, and 12 short courses at <http://www.microscopy.org/MandM/2010/program.cfm>. You may also submit nonsymposium presentations and posters.

The Executive Program Committee is pleased to welcome all microscopists and microanalysts, both veteran and novice, to the vibrant and exciting city of Portland, Oregon. We look forward to meeting you there!


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