



MICROSCOPY & MICROANALYSIS 2011

August 7-11 ★ Nashville Tennessee

Microscopy Y'All: A Preview of M&M 2011 in Nashville

David Giovannucci, Program Chair

Department of Neurosciences, University of Toledo College of Medicine, Toledo OH 43614

David.Giovannucci@UToledo.edu

Microscopy & Microanalysis (M&M) is the annual meeting for the Microscopy Society of America, the Microbeam Analysis Society, and the International Metallographic Society, Inc. This is the premier conference for microscopists working in the physical, life, and analytical sciences.

This is *your* meeting! M&M 2011 will feature over thirty symposia on engaging topics that range from traditional to emerging and innovative fields of research. Contributed platform and poster presentations are solicited for all the symposia. Moreover, the conference organizers will expand the number of self-assembled symposia originating from contributed papers and based on the quality and quantity of thematically related submissions. Between scientific sessions on cutting-edge topics, you will discover why M&M is renowned for the opportunity to peruse the world's most extensive array of state-of-the-art instruments from a who's who of microscopy exhibitors.

This year, the conference will be held in Nashville, Tennessee. Also known as Music City, Nashville is an exciting venue for fans of country music and just about every other kind of music. The city offers family-oriented entertainment, as well as a vibrant nightlife and historic surroundings. What better backdrop for networking, professional development, and catching up with friends and colleagues?

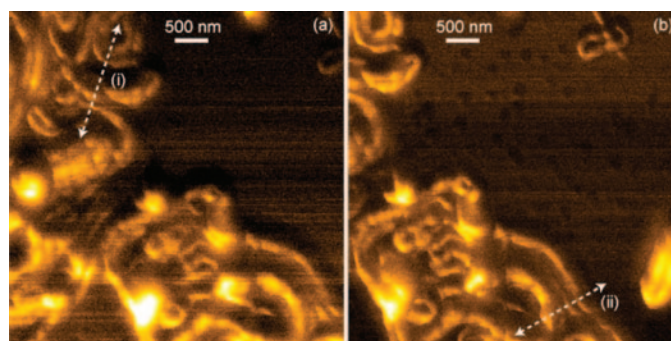


Prof. Stefan Hell, Max Planck Institute for Biophysical Chemistry, will give the opening presentation.

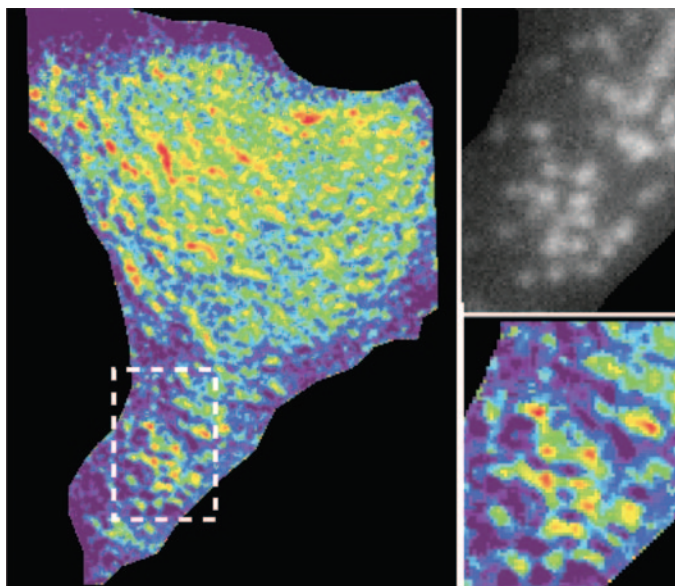
Professor Stefan Hell, a director at the Max Planck Institute for Biophysical Chemistry in Göttingen and head of the Department of NanoBiophotonics, will provide the plenary opening presentation titled "Nanoscopy with focused light." Professor Hell is generally acknowledged for the development of innovative approaches that shattered Ernst Abbe's diffraction-limited resolution barrier enabling nano-scale light microscopy. His talk will spark discussions among physicists, material scientists, and

life scientists who are defining the future of this evolving technology. Complementing symposia on light microscopy methods to achieve nanoscale imaging, our program will address advances in super-resolution TEM with sessions such as "Super-resolution Microscopy" and "Near Field and Single Molecule Imaging in the Life Sciences." For the light microscopist there is a renewed emphasis on fluorescence-microscopy approaches in the life sciences, including total internal reflection microscopy and intra-vital imaging applications.

This year's meeting will also feature two named symposia. The "A. V. Crewe Symposium: From Single Atom Images to Atom-by-Atom Analysis" will honor and commemorate the work of the late Albert Victor Crewe (1927–2009), the physicist who first imaged single atoms and whose influence on electron microscopy has been profound. The revolutionary scanning transmission electron microscope (STEM) with a high-brightness cold field emission gun (CFEG) was designed and built in Crewe's laboratory and produced the first images and movies of single atoms ever recorded. Crewe's group also pioneered electron energy-loss spectroscopy (EELS) performed with high spatial resolution, made electron microscopy more versatile and more quantitative, and introduced a fundamentally new type of an aberration corrector enabling STEM to become the instrument of choice for atom-by-atom



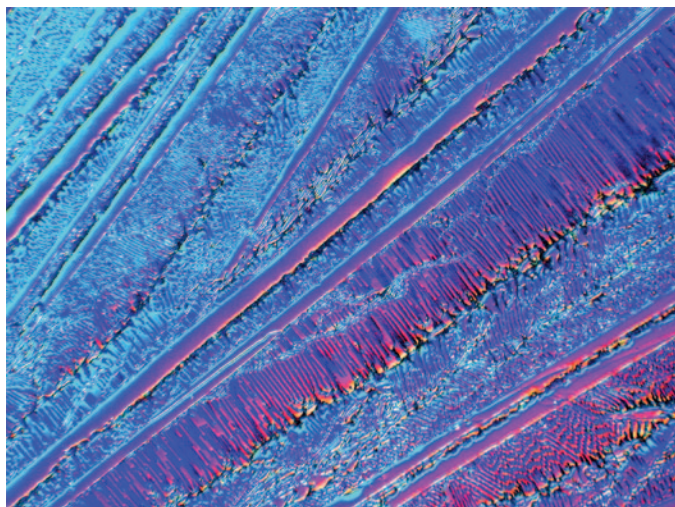
Continuous-wave multiphoton near-field images of J-aggregates of PIC dye in a PVS film. Courtesy of D. Nowak, A.J. Lawrence, E. Sanchez, and *Applied Optics*.



TIRF-FRET imaging of protein-protein interactions in a live Min6 cell. Courtesy of Edward Stuenkel.

explorations of the nano-world. Accordingly, symposia such as “Advances in EELS and EFTEM” will showcase recent improvements in EELS and energy-filtered TEM related to chemical analysis, near-edge structures work, application of low-loss spectroscopy, and instrumentation. Those workers exploring the properties of nano-materials are encouraged to participate in two imaging and spectroscopy symposia on carbon-based and energy-related nano-materials and devices. Many people will find interest in the pre-meeting specialist workshop on “Opportunities, Artifacts and Interpretation of Aberration-Corrected Electron Microscopy Data.”

To celebrate the accomplishments of Raimond Castaing (1921–1998), we present “Microanalysis at 60 Years: A Symposium Dedicated to Raimond Castaing” and welcome contributed presentations by all those interested in microanalysis and microscopy and engaged in current and promising developments in this field. In 1951, Raimond Castaing, a



Hyper-eutectic white cast iron, metallographically polished and etched. Courtesy of Frauke Hogue.

30-year-old student working on a research project at the French Aeronautical Institute with Professor Andre Guinier, presented his thesis at the University of Paris. In this document he both described the makeup of the microprobe instrument, essentially a modified electron microscope outfitted with a Bragg crystal spectrometer, and developed the theory by which accurate composition measurements could be obtained from raw x-ray intensity measurements, taking into account complex matrix effects. Castaing also made other major contributions to electron microscopy in the areas of ion-beam specimen thinning, electron energy-loss analysis, Kossel patterns, and secondary ion mass spectrometry.

We also have planned a robust multi-disciplinary symposium titled “Microscopy and Microanalysis Applications in Cultural Heritage Research.” Millions of visitors every year are attracted to historical cities, archeological sites, museums, and libraries, and there has long been an awareness of the importance of cultural heritage. However, the concept of actively maintaining and restoring artifacts did not take hold until the nineteenth century. The technological advances of the 20th century have provided new tools to study the materials in historical artifacts, their manufacture, and their deterioration related to age and wear. The Cultural Heritage Research symposium will highlight an array of microscopy and microanalysis techniques that aid cultural heritage research, principally in the areas of conservation, maintenance, provenance, and restoration. Materials of study may include metals, coins and jewelry, ceramics (porcelain and pottery), building materials (stone, brick, and mortar), glass, textiles, paper, paint, and pigments.

This year’s conference will continue the emphasis on cross-disciplinary sciences, underscored by such symposia as “Multi-scale Approach to Amyloid Diseases,” “3D Structure of Macromolecular Assemblies, Cellular Organelles and Whole Cells,” and “Advances in 3D Electron Microscopy” that focus on scanning probe techniques and 3D electron microscopy. In addition, we will debut this year a symposium on electron crystallography. Demand for both structure analysis of nano-crystals and advances in instrumentation has engendered new and exciting opportunities for crystallographic applications. This symposium will focus on advances in electron crystallography and their applications to organic and inorganic crystals, automated acquisition, and handling of 3D electron diffraction data, nano-crystallographic fingerprinting, 3D diffraction tomography in real and reciprocal space, and crystallographic data processing.

The Executive Program Committee invites you to review the complete listing of symposia, contributed sessions, workshops, and short courses at <http://www.microscopy.org/MandM/2011/program.cfm>. We welcome microscopists of all disciplines to an inclusive, dynamic, and interactive conference. We can’t wait to see y’all in Music City, Nashville, Tennessee.

The author thanks Ondrej Krivanek, Mike Isaacson, Nestor Zalusec, John Fournelle, John Mansfield, and Mark Ellisman for their helpful contributions to this article.