



MICROSCOPY & MICROANALYSIS

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Microscopy & Microanalysis 2013 in Indianapolis

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The Microscopy Society of America, the Microanalysis Society, and the International Metallographic Society invite you to Microscopy & Microanalysis 2013 in Indianapolis, Indiana. This meeting showcases the latest innovative applications and instrumental developments in the biological and physical sciences. This year M&M will feature two plenary lectures, more than 34 symposia, and many educational opportunities in the form of courses and tutorials.

We are honored to have Prof. Harald Rose from the University of Ulm present a plenary talk entitled “The Long-Lasting Struggle to Achieve Atomic-Resolution Microscopy by Correcting the Aberrations of Electron Lenses.” Prof. Rose was trained as a theoretical physicist in the group of Otto Scherzer and is now a world expert in theoretical electron optics. He has led the fields of aberration correction of electron lenses, energy filters for electron microscopy, and the theory of image formation by inelastically scattered electrons important in low-voltage electron microscopy. During his long and fruitful career, Prof. Rose received numerous international awards in recognition of his accomplishments, including the MSA Distinguished Scientist Award. He is a long-standing member of the Microscopy Society of America and was inducted as an MSA Fellow in 2009.



Plenary speaker Prof. Harald Rose from the University of Ulm.

The electron optics theme will be continued with a symposium honoring the memory of Prof. Gertrude Rempfer who passed away in the Fall of 2011: “Gertrude Rempfer Memorial Symposium on Advances in Electron Optics and Aberration Corrected Electron Microscopy.” After receiving her PhD in physics from the University of Washington, she worked on electron optics and electron microscopy in both industry and academia. Her efforts led to the development of the world’s first ultra-high vacuum photo-emission electron microscope. Gert Rempfer was a true role model for everyone, from her colleagues to students, especially female students. This symposium is intended to allure young scientists to some

fast-developing areas in electron microscopy. In addition, several symposia supplement this topic by investigating the limits, pros and cons, and future of new instruments in several different research fields, for example, “New Instrumentation at the Limits: Characteristics and Applications,” “Low Voltage Transmission Microscopy: Pros and Cons,” and “The Electron Microscope of the Future: Merging the SEM, the STEM and the Ion Microscope.”

Our other plenary lecturer, Prof. Joris Dik from the Technical University of Delft, will show us that microscopy and microanalysis can lead to amazing discoveries when applied to the arts and humanities. Prof. Dik’s lecture, “Looking Through Paintings,” examines how modern instrumentation can uncover art history mysteries. He will focus on the application of portable and synchrotron-based macro XRF elemental scanning to study the substructure of historical paintings using examples from van Gogh and Rembrandt. Prof. Dik possesses a unique background for this endeavor because he majored in art history and has a doctorate in chemistry. He has been successful in developing and applying non-destructive imaging techniques to determine the genesis and attribution of works of art. His accomplishments in revealing hidden paintings by van Gogh, Goya, and Rembrandt have garnered international acclaim and a membership in the Young Academy of the Royal Netherlands Academy of Arts and Sciences. This plenary lecture topic will be expanded in the symposium “The Art in Microscopy and Microanalysis,”



The late Prof. Gertrude Rempfer.



Plenary speaker Prof. Joris Dik from the Technical University of Delft.

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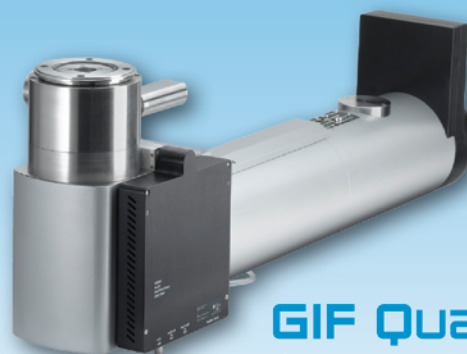
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which will present applications of these technologies in archaeology, art treasures, and cultural heritage.

The advances in instrumentation symposia will cover, in addition to the above techniques, such popular topics as electron and atom probe tomography, electron diffraction, data processing, *in situ* techniques, and real-world microscopy and microanalysis. Methods bridging the physical and biological sciences will be highlighted: “Applications of Micro-CT in Life and Materials Sciences;” “Mass Spectrometry Imaging (MSI): Applications, Current Challenges, and Perspectives;” and “Ion Beam Instrumentation and Applications for Physical and Biological Sciences.” The Technologists’ Forum this year will focus on energy dispersive spectroscopy methods and will provide insights into applications in life and materials sciences. Instrument manufacturers and vendors will have the opportunity to showcase new developments in the “Vendor Symposium: Latest Developments in Tools for Life and Materials Sciences.”

Featured among the life science symposia are the well-established symposia devoted to understanding basic concepts in cellular, molecular, and structural biology: “Structural Biology and Cell Ultrastructure,” “Fluorescence Microscopy of Organelle Dynamics,” and “AFM-Based Nanoscopies in the Life Sciences.” The symposia titled “Utilizing Microscopy for Research and Diagnosis of Diseases in Humans, Plants and Animals” and “Microscopy, Microanalysis, and Image Analysis in the Pharmaceutical Sciences” present aspects in pathology and pharmacology. Two novel symposia explore the role of microscopy and microanalysis in tissue engineering of tissue and medical devices and biomaterials.

Physical science symposia will showcase old and modern materials. The origins of metallography will be remembered in “Microstructural Characterization of Metals—150 Years After Sorby” that will examine the progress since the first observations of microstructure in iron and steel. Other physical science symposia will range from “Structure and Composition Analysis of Nanoparticulate Systems” to “Imaging the Hard/Soft Materials Interface.” Also included will be symposia on failure analysis, catalysts, coatings, ceramics, and polymers.

The successful learning opportunities offered at previous M&M meetings will continue with pre-meeting and in-meeting courses taught by specialists in their fields. The topics of the nine pre-meeting short courses range from 3D EM of macromolecular assemblies to practical considerations for quantitative image analysis. Three in-meeting courses will cover the following topics: introduction to SEM imaging and X-ray compositional analysis, specimen preparation for biological microscopy, and nanomaterial microscopy and microanalysis. Short one-hour tutorials will provide insights into correlative imaging of tissues, biomedical applications of microCT, and practical processing of spectrum imaging datasets, among other topics. We also will showcase our educational opportunities for broader audiences: Project Micro, Microscopy in the Classroom, and It’s a Family Affair.

This year we feature two Pre-Meeting Congresses to be held all day Sunday. The first titled “Opportunities, Challenges, and Outlook for *In situ* Experiments in Liquids and Gases using Electron-Optical Instruments” is organized by the MSA Electron Microscopy in Liquids and Gases (EMLG) Focused

Interest Group. The second will be an “Advanced Materials and Failure Analysis” workshop that will focus on, among other topics, the targeted delivery of chemical cargoes to cancer cells and the emerging needs for high-precision imaging and metrology roadmaps.

As usual M&M 2013 will have the world’s largest microscopy and microanalysis instrument exhibition. Over 100 companies will display their latest equipment and services. Don’t miss this exciting annual event. The “social activity” accompanying each day’s poster session has now become an afternoon tradition in the exhibition hall, and each day closes with the presentation of student poster awards.

A complete description of all the symposia, contributed sessions, educational opportunities, and the multiple award possibilities from the three organizing societies may be found in the Call for Papers (distributed with the November *Microscopy Today*) or at: <http://www.microscopy.org/MandM/2013>.

The Executive Program Committee and the large number of symposia organizers have planted the seed for Microscopy & Microanalysis 2013. Now it is up to all of us to contribute and make the meeting grow. It is up to each of us to join and participate in the societies that come together at the meeting. One day we might be able to say what our plenary speaker, Prof. Harald Rose, said to me: “I consider the Microscopy Society of America my scientific home and the home of many of my scientific friends.” See you in Indianapolis!

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