

MeetingReport

Microscopy & Microanalysis 2018



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The Microscopy & Microanalysis 2018 (M&M 2018) meeting was held this past August 5–9 in Baltimore, MD. This conference was co-sponsored by the Microscopy Society of America (MSA), the Microanalysis Society (MAS), and the Microscopical Society of Canada/Société de microscopie du Canada (MSC/SMC). The meeting featured 1,236 scientific papers (718 platform presentations and 518 posters) and hosted 2,897 attendees (1,693 scientific and 1,204 exhibitor) from over 40 countries. The microscopy and microanalysis exhibition showcased state-of-the-art instruments, support equipment, and specialized services from 116 companies from around the world.

Highlights of the opening session were two truly inspiring plenary speakers who showed the power of microscopy for outreach and societal impact. The first speaker was Jon Larsen, a former professional jazz guitarist and self-described “citizen scientist,” who became the first person to demonstrate reliable collection and identification of micrometeorites from populated areas. For seven years, Jon exhaustively analyzed terrestrial dust particles, including man-made particles he collected at locations around the world. Jon rigged a special camera/lens setup for this work. Through morphological assessment of thousands of microparticles, Jon was able to isolate and identify particles of potential extraterrestrial origin. The nature of these micrometeorites was eventually confirmed via microanalysis at Imperial College London. The culmination of this work can be found in his recently published book, *In Search of Stardust: Amazing Micrometeorites and Their Terrestrial Imposters*.

Our second plenary lecture was delivered by Manu Prakash, Associate Professor of BioEngineering at Stanford University. Manu invented the “Foldscope,” a fully functional 50-cent microscope made mostly of paper but capable of useful magnifications up to 1400×. His company, Foldscope Instruments, has distributed over 400,000 of these affordable microscopes to clinics and schools in 135 countries over the past

five years. His talk included numerous examples where these microscopes provided life-saving medical diagnostics to people in extremely remote regions. He also showed examples where rural villages and schools used Foldscopes for research and education. A global online community, “Microcosmos,” features these explorations (<http://microcosmos.foldscope.com>). Prakash’s talk ended poignantly with a story about a Kentucky teenager and cancer survivor who used his winnings from a science competition to purchase Foldscopes for hundreds of other students. Quoting the teenager: “If something as simple as this foldscope can get someone interested in a medical career or in scientific research, then



Jon Larsen describing micrometeorites



Manu Prakash describing his Foldscope



Assembling and using Foldscopes at the Microscopy Explorations session

every penny is truly worth it. Because while I may not be a great researcher one day, one of the 700 people I helped has a chance to be.” This sentiment made quite an impact on the audience. Following the plenary session, Manu graciously showed dozens of attendees how the Foldscope worked at the MSA Megabooth. Elaine Humphrey hosted a Foldscope workshop at the Microscopy Explorations session (formerly “Family Affair”) later in the week, with over 80 attendees (including children) participating.

The awards portion of the plenary session honored numerous scientists and students. Yimei Zhu (Brookhaven National Laboratory) and Richard Leapman (National Institute of Health) were honored with the MSA Distinguished Scientist Award in Physical and Biological Sciences, respectively. The Microanalysis Society introduced its inaugural class of 28 fellows to recognize “eminent scientists, engineers, and technologists in the field of microanalysis of materials and related phenomena who have distinguished themselves through outstanding research and service to the microanalysis community.” Additionally, eight of our colleagues were installed as MSA Fellows: Wen-An Chiou, Linn W. Hobbs, Elaine C. Humphrey, Kazuo Ishizuka, David J. Larson, Guillermo Solórzano-Naranjo, Judith C. Yang, and Jian Min Zuo. The Burton Medal was awarded to Lena F. Kourkoutis of Cornell University. Timothy Pennycook of Max Planck Institute received the Albert Crewe Award. Donovan Leonard received the Morton D. Maser Distinguished Service Award for his tireless work and consistent support of MSA and its education programs at many M&M meetings. Anchi Cheng received the Hildegard H. Crowley Outstanding Technologist Award for Biological Sciences, and Chengyu Song received the Chuck Fiori award for Outstanding Technologist in Physical Sciences. In addition, 55 Student and Post-doctoral Scholar Travel Awards were jointly sponsored by MSA and MAS. Best poster awards were given out each day of the meeting.

There were three well-attended pre-meeting congresses. On Saturday, the second annual “Pre-meeting Congress for Early Career Professionals in Microscopy and Microanalysis” was hosted by the MSA Student Council. The other two pre-meeting events that took place on Sunday were: “Standards and Reference Materials for Microanalysis” hosted by the MSA Focused Interest Group (FIG) on MicroAnalytical Standards and “Practical Challenges and Opportunities for *in situ/operando* Microscopy in Liquids and Gases” hosted by the Electron Microscopy in Liquids and Gases FIG.

The technical program of the meeting consisted of 35 symposia on analytical sciences, biological sciences, and physical sciences. One of the highlights of the meeting was the Prof. Hatsujiro Hashimoto Memorial Symposium “Foundations in Imaging Crystals, Defects, and Atoms.” This symposium was an opportunity to appreciate Prof. Hashimoto’s many contributions to transmission electron microscopy, including high-resolution imaging and the development of specialized instruments and specimen holders. Other symposia of note covered important areas of active development within the fields of microscopy and

microanalysis, including 4D-STEM, machine learning and compressive sensing, and minimizing beam-sample interactions. A session within the 2018 Technologists’ Forum was dedicated to the late Elizabeth Ann Ellis, a charter member of the MSA Technologists’ Forum and a widely regarded expert in biological specimen preparation. This session featured a series of invited speakers who reflected on her many years of teaching and mentorship.

Two successful panel discussions were organized as part of the in-meeting tutorial sessions. One was “Entrepreneurship in the Microscopy Community,” where several entrepreneurs made remarks and held a Q&A session with attendees on instrument development, starting a microscopy-based business, and start-up best practices. Another panel, organized by the Facilities and Operation Management FIG, was on the topic of “Procuring Government Funding for Microscopy Instrumentation and Research.” This panel featured program managers from various funding agencies, including the National Institutes of Health, US Army Research Office, and the National Science Foundation.

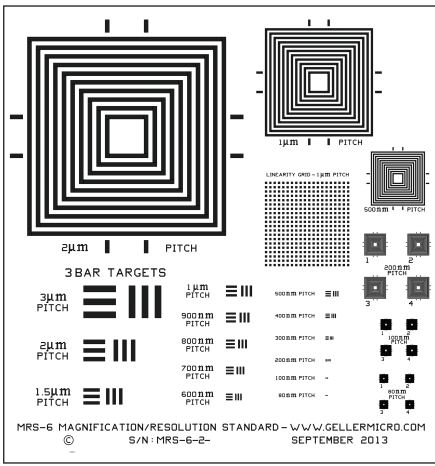
Baltimore was a bit warm, but the good weather allowed attendees to partake of the wonderful nearby activities during M&M 2018. There were many great restaurants, attractions, and evening gathering places for continued discussion of the day’s presentations. Our meeting in Baltimore was clearly a success. Now we look forward to next year, when we hope to see you August 4–8 at M&M 2019 in Portland, Oregon.

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