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Scanning Microscopies 2012: Advanced Microscopy Technologies for Defense, Homeland Security, Forensic, Life, Environmental, and Industrial Sciences

**Michael T. Postek
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Introduction

The Scanning Microscopies 2012: Advanced Microscopy Technologies for Defense, Homeland Security, Forensic, Life, Environmental, and Industrial Sciences (Conference 8378) brought microscopists from all aspects of scanning microscopies (from scanned optics and probes to scanned particle beams) together in a single forum to discuss current research and new advancements in the field. Last year, the SCANNING 2011 meeting merged with the SPIE Defense Security and Sensing 2011 (DSS 2011) conference. On the surface, this merger did not seem initially intuitive, but in previous years, the SCANNING meetings had a large forensics science following which was strongly supportive of both defense and homeland security. Scanned microscopies are also key investigative and research tools in all three of the topics encompassed by the DSS meeting. In addition, while visiting the commercial exhibit at the 2011 SPIE conference revealed numerous examples of scanning microscopy instrumentation, a strong indication of the importance of this broad class of imaging technology to the range of topics in the conference program. It became abundantly clear that scanning microscopies are used across the gamut of topics covered by this overall symposium and merging SCANNING with this symposium was an appropriate move for the future of the conference.

The SCANNING Microscopies Conferences have been typically instrument and technique intensive, as opposed to other DSS Conferences which are generally more applied. With that in mind a joint session with Conference 8373 Micro- and Nanotechnology Sensors, Systems, and Applications IV (Conference 8373) entitled Scanning Microscopies for Micro and Nanotechnology Applications was held in order to "cross-pollinate" between the two Conferences. In this session, the opening invited paper of the conference was presented by Dr. Oliver Wells entitled "Past, present, and future of BSE imaging in the SEM" (8378-1). At the end of the presentation Dr. Wells was recognized with the first Professor Sir Charles Oatley Memorial Award: "in recognition for his pioneering work in the field of scanning electron microscopy and his over 60 years of dedication to microscopy education and research." This provided an opportunity for both conferences to see and meet a true pioneer in the field of scanning electron microscopy. In addition, a number of general tutorial-like invited presentations such as: "Faults and foibles of quantitative EDS" (8378-2) and "Does your SEM really tell the truth?" (8378-4) discussed some of the basics of measurement and energy dispersive x-ray microanalysis in the scanning microscope.

The SCANNING 2012 conference was quite successful. Sessions encompassed papers covering forensics applications, scanning electron microscopy, helium ion microscopy; scanned probe microscopy, scanned optical microscopy and particle beam microscopy. In addition, in keeping with the DSS overall theme, the session: "Scanning Microscopies and the Study of Chemical Warfare Agents" was

organized for the first time by Dr. John Petrali. In addition, another new session introduced at DSS 2012 was "Microscopy for STEM Educators" featured a general interest forum with several notable invited speakers discussing their successful programs implementing microscopy in science, technology, engineering and math (STEM) education to foster student interest and excitement. A hands-on session with tabletop scanning electron microscopes was also held at the end of the presentations and the attendees were encouraged to bring samples of interest and operate the instruments. The STEM educators received a special one-day reduced registration fee which included a visit the exposition.

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