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Analysis Society



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on

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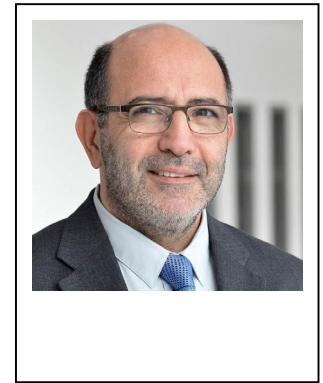
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**MULTI BEAM SEM (MSEM): EXTREME LARGE 2D AND 3D NANOSCALE
APPLICATION**
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Antonio Casares is sales and applications specialist at ZEISS Research Microscopy Solutions in Germany. He has more than 25 years of experience in the design of mass spectrometers and electron microscopes and a deep application knowledge in those techniques. Antonio holds an MSc in biophysics from the University of Giessen (Germany), where he also earned his PhD in “Charged Particle Optics”, followed by post-doctoral work at the Max Planck Institute in Germany and the Oak Ridge National Laboratory in the U.S.A., before he joined ZEISS Microscopy in 2002.

1. ABSTRACT

Modern microscopy labs are typically outfitted with a suite of instruments, capable of capturing data across a range of length scales in 2D and 3D, from the centimetres to the sub-nanometres. These imaging instruments are often complimented by analytical techniques, such as spectroscopic chemical characterisation platforms or mass spectrometry and are designed to produce a comprehensive depiction of the material under investigation.

Recently, a novel multi-beam SEM (MSEM) technology for imaging of large sample areas has been developed by ZEISS. The MultiSEM family features 61 or even 91 electron beams scanning in parallel, resulting in an imaging throughput of up to 2 TeraPixels per hour [1] is now achievable, therefore, enabling extremely large-scale imaging experiments in 2D and 3D.

Here, we present a unique advancement enabling correlative microscopy, which uses a centralised software platform to pull together data from light-, electron-, ion-, and X-ray microscopy (XRM). Beyond just correlating the various datasets, the approach allows data from one technique to be used to drive the hardware in another technique, facilitating easy transfer of information between the suite of available microscopes and the operator.

The presentation will give an overview of the current state of the technology, its potential application space and the challenges in data handling imposed by the enormously increased data rate.

REFERENCES

- [1] Crosby K, Eberle A L and Zeidler D 2016 *MRS Advances* **1** 1915-1920