



Contribution ID: 1125

Type: **No preference**

# Digital Materials Design

*Wednesday, 16 May 2018 14:00 (25 minutes)*

Digital materials design (DMD) coupled with new manufacturing techniques are emerging technologies that have the potential to revolutionize product realization on a global scale. The Economist magazine likened the emergence of these novel imaging, modelling and manufacturing methods to the start of the third industrial revolution. Companies and laboratories now need to turn their attention to detailed multiscale structure, synthesis, processing, properties, and performance characteristics of the materials (most of them porous) that will fundamentally determine the success or failure of direct customised components.

The key to DMD is access to efficient facilities and tools to characterise material structure and function at multiple scales (from nanometers to structural sizes), in multiple states (relaxed vs under compression, before/after reaction or dissolution) and with multiple probes (multiple x-ray spectra, SEM, chemical imaging with infrared spectroscopy, etc.). Experimental data can then be used to support and validate multiscale simulation work within a DMD environment. This talk will first outline the development of an integrated workflow based on 3D multiscale imaging, analysis and modelling for geomaterials. The presentation discusses the potential for the technology to have a much broader reach beyond the geoscience arena—touching companies and industries and giving rise to a wide range of machines, products, or services.

## References

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**Session Classification:** Invited 3 (Room B) - Mark Knackstedt

**Track Classification:** GS 3: Experimental achievements