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TMS 2020

149th Annual Meeting & Exhibition

February 23-27, 2020 • San Diego, California, USA



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Characterization

Characterization: Structural Descriptors, Data-Intensive Techniques, and Uncertainty Quantification

This symposium focuses on the development and use of computational and data intensive characterization capabilities used by experimentalists and modelers to investigate materials structure and mechanisms at varying length and time scales. It intends to bring together experimental and theoretical experts in computational and data intensive microstructure characterization from both academia and industry, with a focus on the methods and techniques to effectively manipulate, reconstruct, analyze, and apply these data to develop improved predictive capabilities for multi-scale materials design.

Areas of focus for this symposium will include:

- Theoretical and computational development of novel structural descriptors to characterize microstructural features (e.g. grain boundary atomic and crystallographic structure, crystallographic texture, distributions of triple junction types), and their application to quantitatively characterize experimental and simulation data, and develop new predictive microstructure-property models
- Methods and algorithms for collecting, reconstructing, analyzing, and quantifying large experimental microstructural datasets collected from tools such as: atom probe tomography, x-ray computed tomography, or high-speed measurements
- Methods and algorithms for the detection, analysis, and quantification of microstructural features predicted through atomic and mesoscale simulation data. Validation approaches for computational and theoretical models using structural descriptors and advanced experimental mechanics techniques. Methods to bridge modeling and experiment through computed characterization (e.g. virtual X-ray and electron diffraction and simulated microscopy)
- Application of advanced analysis techniques, such as machine learning and artificial intelligence, to develop multi-scale microstructure descriptors and provide greater insights into materials characterization data
- Methods for quantifying the uncertainty inherent in manipulation, reconstruction and analysis of large sets of characterization data

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Abstract Deadline is July 1, 2019. Submit online at
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Questions?

Contact programming@tms.org