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JOM TECHNICAL TOPICS

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JUNE 2022

30 Years of Oliver-Pharr: Then, Now, and the Future of Nanoindentation

Scope: The 1992 seminal publication by W.C. Oliver and G.M. Pharr laid a cornerstone for the development of nanoindentation as reference technique for nanomechanical characterization. The "Oliver-Pharr" method has enabled numerous transformative research efforts in a wide range of fields spanning materials science, geology, biology, and medicine. This special topic is devoted to its amazing range of applications, as well as the current developments and future trends that it continues to inspire.
Editors: **Verena Maier-Kiener**, University of Leoben; **Benoit Merle**, University of Erlangen-Nuremberg; and **Samantha Lawrence**, Los Alamos National Laboratory
Sponsor: Nanomechanical Materials Behavior Committee

Magnetic Structure Characterization Over Multiple Length Scales

Scope: Magnetic structures form over multiple length scales. Characterization of magnetic structures over multiple length scales plays an essential role in advancing the understanding of structure-property-processing relationships of magnetic materials. This topic covers various complementary characterization techniques that help illuminate the magnetic phenomena from atomic-scale spin configurations to nano-scale structures to meso-scale domains in magnetic materials.
Editor: **Yongmei Jin**, Michigan Technological University
Sponsor: Magnetic Materials Committee

New Frontiers in Physical Metallurgy of Steels

Scope: This topic presents articles focusing on physical metallurgy of steels with novel alloying concepts including increased levels of elements such as Mn, Al, and Si. Novel microstructure concepts and processing strategies to manufacture high performance steels are included.
Editors: **Amit Behera**, QuesTek Innovations LLC, and **Ana Araujo**, Companhia Brasileira de Metalurgia e Mineração (CBMM)
Sponsor: Steels Committee

Phenomena and Scales Influencing Alloy Solidification Microstructures

Scope: This topic focuses on numerical predictions and experimental observations of the coupling/interaction of processes that occur across varying length and time scales simultaneously during solidification. Examples include microstructure simulations to characterize macroscopic properties such as permeability or experiments such as bulk stirring that have a direct influence on microstructure solidification.
Editor: **Andrew Kao**, University of Greenwich
Sponsor: Solidification Committee

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