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TMS 2025
154th Annual Meeting & Exhibition



March 23–27, 2025
MGM Grand Las Vegas
Hotel & Casino
Las Vegas, Nevada, USA
#TMSAnnualMeeting



SUBMIT AN ABSTRACT FOR THE FOLLOWING TMS2025 SYMPOSIUM:

DATA-DRIVEN AND COMPUTATIONAL MATERIALS DESIGN



Microstructural Evolution and Material Properties due to Manufacturing Processes: A Symposium in Honor of Anthony Rollett



Most physical properties of a material stem from its microstructure, the arrangement and population of boundaries and defects at the microscopic scale that constrain the long-range order and motion of a material's constituent atoms as it undergoes mechanical deformation. Engineered parts and structures rely on tailored manufacturing processes and a deep understanding on how such processes lead to specific microstructures that can bestow desired attributes such as strength, hardness, ductility, corrosion resistance, etc. This understanding, along with defined relationships between process parameters and the microstructure evolution, are essential to all varieties of manufacturing techniques such as thin film deposition, rolling, extrusion, machining, and 3D printing (also known as additive manufacturing).

Anthony Rollett – the U.S. Steel Professor of Metallurgical Engineering and Materials Science at Carnegie Mellon University and Co-director of its Next Manufacturing Center – has made crucial contributions throughout his career in uncovering and defining the microstructure-property relationships characteristic of such manufacturing methods. Through his work in both computational simulation and experiments, he has investigated topics such as recrystallization, grain boundary migration, viscoplastic deformation, annealing, residual stress, strain aging, and powder bed fusion (among many others) and brought clarity on how manufacturing-induced defects impact a material's resultant properties. This symposium is intended to honor his contributions to the field of materials science and highlight the work of others who have been inspired by him and his accomplishments. This honorary symposium will feature invited presentations from colleagues and collaborators of Dr. Rollett, as well as contributed presentations from members of the materials and manufacturing community who follow in his footsteps to use modeling and characterization methods to gain fundamental insights on microstructure evolution during manufacturing and the process-structure-property relationships that can be inferred.

Submitted abstracts should seek to present work that connects manufacturing methods, microstructural phenomena, and physical & mechanical properties. Special consideration will be given to abstracts that highlight how work by Dr. Rollett has inspired current developments and lines of scientific inquiry.

ORGANIZERS

Jonathan Zimmerman, Sandia National Laboratories; **Curt Bronkhorst**, University of Wisconsin-Madison; **Elizabeth Holm**, University of Michigan; **Ricardo Lebensohn**, Los Alamos National Laboratory; **Sukbin Lee**, Ulsan National Institute of Science and Technology; **Nathan Mara**, University of Minnesota

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QUESTIONS?

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