Department of Engineering Physics
UNIVERSITY OF WISCONSIN–MADISON

INSTITUTE FOR NUCLEAR ENERGY SYSTEMS

Department of Materials Science and Engineering
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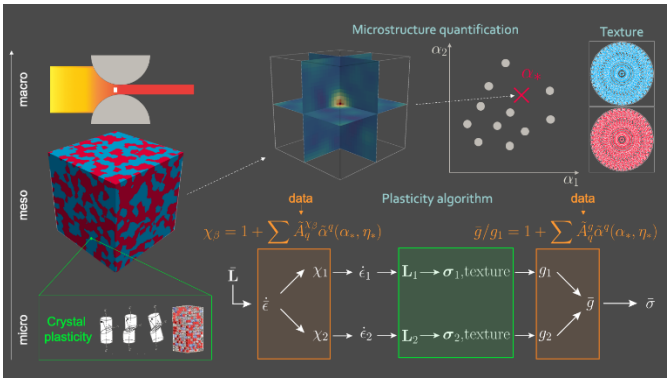

Presents:
Dr. Marat I. Latypov,
University of California Santa Barbara

From physics-based models to materials research in the cloud

Abstract: Accelerating design and discovery of new materials critically depends on the development of efficient computational and experimental tools for rapid screening of potential compositions, microstructures, and processing routes for targeted performance characteristics. In this talk, I will review my research developments focused on physics-based models, data-driven models, and their incorporation into cloud-based platforms for easy access and efficient use by materials scientists and engineers. In the first part, crystal plasticity finite element models for predicting microstructure evolution during new metal forming processes and strain localization in Ni-base superalloys will be presented. The second part will focus on building efficient reduced order models capturing process—structure—property relationships based on data obtained from physics-based models or experiments. Implementation of these data-driven models into online platforms for efficient materials research in the cloud will be presented in the third part. Other applications of data-driven models for multiscale modeling, high-throughput characterization, and design will be also discussed.

***Biography*:** Dr. Marat Latypov is a postdoctoral scholar at the University of California Santa Barbara. His research interests are focused on accelerating materials innovation by cross-disciplinary approaches. Marat has received his Ph.D. in Materials Science and Engineering from POSTECH (Pohang, South Korea) in 2014, spent two years as a postdoc researcher at the European campus of Georgia Tech (Metz, France), and joined UCSB in 2017.

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1:30 PM, MSE 265