

DEPARTMENT OF MECHANICAL ENGINEERING

WILLIAM MAXWELL REED SEMINAR SERIES

“Computational Study of Microstructure-Property Relationships of Crystalline Materials”

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Abstract: In this talk I will discuss the paradigm of using multiscale modeling to study the microstructure-property relationships of crystalline materials and the benefits it offers in terms of improved understanding of existing materials, and a more efficient pathway for developing next generation materials. As a specific application, I will present some recent work on modeling the texture evolution and thermomechanical response of Copper-Niobium lamellar composites produced by accumulative roll bonding (ARB). Accumulative roll bonding is a severe plastic deformation processing technique that can be used to fabricate bulk lamellar nanocomposites with controllable layer thickness. ARB Cu-Nb nanolaminates have exceptional strength properties compared to either constituent material due to a transition from bulk-dominated to interface-dominated plasticity as the layer thickness is refined. Crystal plasticity finite element simulations are used in an effort to sort out the relative contributions of the deformation mechanisms involved in this transition and on the overall strength of the composites.

Abstract: Dr. Jason Mayeur is a Senior Research Engineer in CFD Research Corporation’s Biomedical and Energy Technology Division. Dr. Mayeur received his Ph.D. in Mechanical Engineering from Georgia Institute of Technology in 2010. Prior to joining CFDR in 2017 he was a postdoctoral researcher and staff scientist in the Fluid Dynamics and Solid Mechanics Group of the Theoretical Division at Los Alamos National Laboratory. His research focuses on using multiscale modeling and simulation to study the microstructure-property relationships of crystalline materials, with particular interests in interface-mediated plasticity, nanostructured materials, and material response under dynamic loading conditions. Dr. Mayeur’s work has been funded by AFOSR, Sandia National Laboratories, Los Alamos National Laboratory, and DOE BES.

Date: Monday, March 5th
Place: CB 118

Time: 3PM
Contact: Dr. Alexandre Martin 257-4462

Meet the speaker and have refreshments
Attendance open to all interested persons