SEMINAR SERIES

PREDICTING NANO/MICROSTRUCTURES AND PROPERTIES OF MATERIALS BY MULTISCALE COMPUTATIONAL MODELING

THURSDAY, DECEMBER 6 | 4 P.M.| HILL HALL 202

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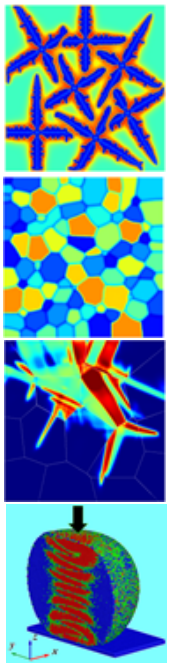
Dr. Mohsen Asle Zaeem is an associate professor in the Department of Mechanical engineering at the Colorado School of Mines since August 2018. Prior to joining Mines, he was the Roberta and G. Robert Couch Assistant Professor, and later promoted to associate professor in Materials Science & Engineering at Missouri University of Science & Technology (Rolla). Dr. Asle Zaeem received his B.S. (2003) and M.S. (2006) in Mechanical Engineering from Shiraz University, and his Ph.D. in Mechanical Engineering at Washington State University (2010). In 2010, Dr. Asle Zaeem joined the Center for Advanced Vehicular Systems in Mississippi State University as a postdoctoral research associate, and was later promoted to a research assistant professor. He has published more than 60 peer-reviewed journal articles in prestigious journals, and he is currently serving as an editor of the Journal of Metals, and he is also a member of the editorial board of Mathematical Problems in Engineering and International Journal of Materials Engineering and Technology. Dr. Asle Zaeem is a member of different technical committees of TMS, ASME and ASM, including Integrated Computational Materials Engineering, Solidification, Phase Transformation, Materials Properties Database, Diversity, Computing in Applied Mechanics, and Manufacturing Engineering Committees. He is the recipient of the 2017 TMS-FEMS Young Leader International Scholar Award, 2016 Faculty Research Excellence Award of Missouri S&T, 2016 Certificate of Highly Cited Research in Computational Materials Science (Elsevier), 2015 and 2017 Certificate of Excellence in Reviewing from Acta Materialia, 2017 IOP Outstanding Reviewer Award, 2015 TMS Young Leader Professional Development Award, 2015 Junior Faculty Award from Mines and Metallurgy Academy, and 2015 ACS New Investigator Award.

Predicting and controlling the structure-property-processing relations in materials play important roles in design and manufacturing of engineering parts and structures. With the recent progress in supercomputing, computational modeling and simulations have become commanding modules in studying these relations in materials, which also enable design of new generation of materials in a faster pace.

In this seminar, different computational models based on the phase-field, molecular dynamics, and density functional theory approaches will be presented to quantitatively simulate nano and microstructures, and determine properties and deformation/failure mechanisms of different materials. Examples will include computational modeling of solidification of metallic alloys, diffusional and martensitic phase transformations in metals and ceramics, deformation and failure of ceramics and 2D MXenes, and crack propagation in ultra-high temperature composite ceramics.



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