MSE SEMINAR

Materials Science and Engineering
Michigan Technological University

Tuesday, March 24, 2015
11:00 am – 12:00 pm
Room 610, M&M Building

Characterizing Complex Microstructures in a Three-Phase Eutectic

John & Virginia Towers Distinguished Lecture Series

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Abstract

While binary eutectic systems are relatively straightforward and generally well understood, the added degree of freedom in a ternary system creates a far greater level of complexity. Directionally solidified Al-Ag-Cu will be used as a model system to demonstrate the formation of two-phase dendrites and the range of patterns formed by three non-faceted phases solidifying simultaneously from the melt. Methods for characterizing these complex ternary eutectic microstructures will be discussed, including measures of phase fraction, composition, crystal orientation, and nearest neighbor distribution. The effect of unusually large changes in the solid state, due to a feature of the Al-Ag phase diagram, will also be described.

Biography: Amber Genau is an Assistant Professor in the Department of Materials Science and Engineering at the University of Alabama at Birmingham. She received her PhD in Materials Science and Engineering at Northwestern University and her B.S. and M.S in Materials Engineering at Iowa State University. Before coming to UAB, she spent two years as a guest scientist at the German Aerospace Center (DLR) in Cologne, Germany. Her research interests include solidification and coarsening of metal alloys, and quantifying complex microstructures in two and three dimensions.

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