

Spring '17 Seminar Series
Department of Materials Science and Engineering
Center for Advanced Materials and Nanotechnology

Characterization of Novel Microstructures in Ternary Eutectics

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Tuesday, April 25, 2017--- 4:10 p.m. --- WH 303

Abstract

While binary eutectic microstructures are relatively straightforward and well understood, the additional degree of freedom in three-component alloys can allow for three phases to solidify simultaneously from the melt. These ternary eutectic structures exhibit a far greater level of complexity and are useful for understanding the factors that control multi-phase, multi-component solidification more generally. The fundamentals of higher-order eutectics will be explained, before describing recent experimental and modeling work on the model system of Al-Ag-Cu. By directional solidification at relatively low velocities and thermal gradients, ternary microstructures with varying degrees of alignment were produced and studied. These microstructures will be discussed both qualitatively and quantitatively, using measures such as phase fraction, composition, crystal orientation, and nearest neighbor distribution. The effects of unusually large changes in the solid state, due to the usual shape of the phase diagram, will also be described.

Biography

Dr. 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.

Refreshments served at 3:45 p.m. in Student Lounge – Whitaker 349
Attendance is required of all full-time MSE Graduate Students.
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