

The Department of  
**Mechanical Engineering**  
PRESENTS

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**Friday, May 13, 2016**  
**WCH Room 205/206**  
**11:10-12:00PM**

***Growth Nanotwins in Alloyed systems***

***Abstract:***

Highly nanotwinned (nt) metals have shown a strength comparable to nanocrystalline metals, while maintaining other desired properties including ductility, conductivity, and thermal stability. However, the deformation mechanisms and mechanical stability of the nt metals is not yet fully understood but can be directly linked to large number of S3 boundaries present. In this presentation, results from highly aligned nt-Cu and nt-CuAl samples tested in compression, and tension under various loading/testing conditions relative to the twin boundary (TB) direction will be presented as well as thermal and corrosion stability studies. The microstructures of the tested samples were analyzed before and after deformation for each loading configuration in order to study the stability of the nanotwins.

Additionally, the synthesis of Cu alloys of different compositions (Cu-6wt.%Al, Cu-4wt.%Al, Cu-2wt.%Al, and Cu-10wt%Ni) will be discussed. The stacking fault energy (SFE) of these alloys vary from 6 mJ/m<sup>2</sup> to 74 mJ/m<sup>2</sup>. Extensive transmission electron microscopy (TEM) was used to characterize the microstructures of the different alloys, and correlate the changes in twin thickness to the processing conditions.

***About the Speaker:***

Dr. Andrea Hodge is the Arthur B. Freeman Professor of Chemical Engineering and Materials Science and of Aerospace and Mechanical Engineering. She received her Ph.D. degree in Materials Science from Northwestern University, in 2002, and became a Post-Doctoral Fellow at Lawrence Livermore National Laboratory that same year. In 2007, she joined USC as an Assistant Professor of Aerospace and Mechanical Engineering. Andrea has co-authored over 70 peer-reviewed publications and two book chapters. Her research interests range from processing of nanocrystalline and nanoporous materials to nanomechanics of metals and biomaterials. She recently served on the Board of Directors of the Materials Research Society (MRS). Andrea is the recipient of, a 2008 NSF BRIGE Award, a 2010 NSF CAREER Award, a 2011 Alexander von Humboldt Senior Research Fellow, a 2012 ONR Young Investigator Program (YIP) Award, a 2012 DARPA Young Faculty Award (YFA), and a 2013 National Diverse Education Emerging Scholar Honor.