

UNH Materials Science Seminar

11:10-12:00, Thursday, November 16, 2006

DeMeritt Hall 209B

University of New Hampshire

Fabricating Nanoscale Features in Bulk Metallic Glass Materials

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Bulk metallic glass materials exhibit unique material properties, including Newtonian fluid characteristics when heated to their supercooled liquid state. These materials are used for a wide range of applications such as industrial coatings, armor piercing ammunition, and sporting goods equipment, where high strength, temperature resistance, and high energy transfer are required. Recent research has demonstrated the ability to create microscale features using metallic glasses, potentially providing an alternative material and fabrication technique for MEMS applications. The small size scale is advantageous as the required energy to heat the components is low and can be produced by devices such as a laser. Furthermore, the absence of a polycrystalline structure allows small feature sizes to be accurately and completely fabricated while still providing metallic properties. However, the extension of this research to the nanoscale has not been investigated. In this presentation, preliminary data related to the replicating of nanoscale features in a bulk metallic glass material will be presented. Furthermore, potential nanotechnology applications from the UNH Center for High-rate Nanomanufacturing will be discussed.

Brad Kinsey is currently an Assistant Professor in the Mechanical Engineering Department at the University of New Hampshire. He received his Bachelor's degree from the University of Michigan in 1992 and his Master's and doctoral degrees from Northwestern University in 1998 and 2001 respectively, all in Mechanical Engineering. His awards include the 2006 Ralph R. Teetor Award from the Society of Automotive Engineers and a fellowship from the Department of Energy's Integrated Manufacturing Program.