



Department

of

Mechanical Engineering

The Mechanical Engineering Department cordially invites you to our:
DEPARTMENT SEMINAR

Topic: Microcompression of Single-Crystal Magnesium: When is Smaller Stronger?

Speaker: Ms Cynthia M. Byer

Date: Wednesday, 15 February 2012

Time: 2:00 pm - 3:00 pm

Venue: EA-06-02 (map of NUS can be found at <http://www.nus.edu.sg/campusmap/>)

Abstract

In recent years, we've learned that decreasing the size of a sample may increase its strength, but we now know there are some caveats. In this study, we focus on the impact of initial dislocation density on the deformation mechanisms and size effects in single-crystal magnesium. Micropillars (approximately 1 to 10 micrometers in diameter) are fabricated using focused ion beam (FIB) milling on both chemically etched and unetched single crystals. Transmission electron microscopy (TEM) is used to verify the initial microstructures. Specimens are loaded along the [0001] c-axis and reveal that etched samples with lower initial dislocation densities exhibit a stronger size effect than unetched samples with higher initial dislocation densities, and microcompression experiments along the [2-314] axis further demonstrate the strong anisotropy inherent in magnesium. Results indicate that the strength of pure single-crystal magnesium may be controlled through variation of the orientation, initial dislocation density, and sample size.

About the Speaker

Originally from Maryland in the United States, Cynthia received her bachelors degree in mechanical engineering from the University of Maryland, Baltimore County in 2007. From there, she went on to study at Johns Hopkins University, where she completed her masters degree in 2009. She is currently a PhD candidate in the field of experimental solid mechanics at Johns Hopkins University and plans to defend this year.

****Admission is Free. All are welcome to attend.****