

# MSE SEMINAR

April 14, 2017

113 McBryde Hall

3:30 – 4:30 PM

Refreshments at 3:00 PM

## *Hongfei Ju*

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### **“Centrifuge-aided Micromolding of Micron- and Submicron-sized Patterns”**

#### **Abstract**

Effective and low-cost microfabrication techniques are required to produce miniaturized components. Developed from soft lithography, replica molding has been proven to be a good method to prepare micron- and submicron-sized features. However, the fidelity of the features can be compromised by incomplete feature cavity filling and feature shrinkage during the forming process. In this study, centrifuge-aided micromolding is developed to prepare micron- and submicron-sized ZnO features. By introducing a centrifugal force, the shear-thinning behavior of the suspensions can be utilized to accelerate the cavity filling process and the diffusion of trapped air out of the features. The drying shrinkage is decreased by increasing the density of the wet nanoparticle packing from the centrifugal process. The centrifugal force improves the fidelity of all the designed features. ZnO ridges from 2  $\mu\text{m}$  to 400 nm size and rods of 2  $\mu\text{m}$  size are prepared successfully. The wide applicability of this strategy has been demonstrated by preparing ZrO<sub>2</sub> features via the same method.

#### **Bio**

Hongfei Ju is a graduate student in the Materials Science and Engineering Department, advised by Dr. Kathy Lu. He received his B.S. and M.S. in MSE from University of Science and Technology Beijing in 2011 and 2014, respectively. His research interest involves understanding patterning and sintering behavior of micron- and submicron-sized ceramic features.