

MECHANICAL AND AEROSPACE ENGINEERING COLLOQUIUM SERIES

“Strength of nanoscale structures”

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Friday, September 11, 2009

1:30PM

205 Thurston Hall

Refreshments: 2:30pm, 206 Thurston Hall

ABSTRACT

In small size scale structures, fabricated from materials with very low defect densities, it is likely that the structure will contain very few or even no volume defects. In such a case "defects" on the surface may control the strength of the structure. To explore the effects of the surface on fracture strength statistics, we developed a method where doubly clamped beams etched into Si (111) wafers are tested using an atomic force microscope (AFM) as the testing machine. The talk will discuss the experimental method and will present results that demonstrate the effect of surface roughness, oxidation and protection of surfaces with a self-assembled methyl monolayer on fracture strength statistics.