

Speaker: Prof. Julia R. Greer
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ABSTRACT: While "super-sizing" seems to be the driving force of our food industry, the direction of materials research has been quite the opposite: the dimensions of most technological devices are getting ever smaller. These advances in nanotechnology have a tremendous impact on parts of the economy as diverse as information, energy, health, agriculture, security, and transportation. The functionality of these devices directly depends on their structural integrity and mechanical stability, driving the necessity to understand and to predict mechanical properties of materials at reduced dimensions. Yield and fracture strengths, for example, have been found to deviate from classical mechanics laws and therefore can no longer be inferred from the bulk response or from the literature. A key focus in Professor J.R. Greer's research is the development of innovative experimental approaches to assess mechanical properties of materials whose dimensions have been reduced to nano-scale not only vertically but also laterally.

BIOGRAPHY: Julia joined the Materials Science department of Caltech in the summer of 2007. She studied Chemical Engineering with a minor in Advanced Music Performance at Massachusetts Institute of Technology and received her Ph.D. in Materials Science and Engineering from Stanford University. She has also worked at Intel Corporation. Greer is a recipient of the DARPA Young Faculty Award, TR-35, Technology Review's Top Young Innovator award, the NSF CAREER Award and American Association of University Women Fellowship (2003). She is also a concert pianist, with most recent performance of violin-piano recital in the Lagerstrom Chamber Series (2009) and as a soloist of the Brahms Concerto No. 2 with the Redwood Symphony (2006).