

## **Mechanics of Nanoscale Soft Contacts**

**Debashish Das<sup>1</sup>, Ioannis Chasiotis<sup>1</sup>**

<sup>1</sup>Aerospace Engineering, University of Illinois at Urbana Champaign, 104 S Wright St, Urbana,  
IL, USA

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The interaction between adhesion and friction at micro/nanometer length scales determines the macroscopic behavior of natural and synthetic materials, such as connective tissues, filtration systems, etc. In this work, micromachined MEMS-based force sensors were used to measure the rate-dependent interaction between polymer fibers in the diameter range of 400 nm–4  $\mu$ m. Contact and fracture-mechanics models were used to estimate the contact area and explain observed jump instabilities. The interfacial shear strength during sliding was found to be constant for a broad range of contact radii. Shear yielding during sliding was identified as the origin of static friction in nanoscale soft contacts.