

Abstract Submitted  
for the MAR06 Meeting of  
The American Physical Society

**Theory of the Effects of Multiscale Surface Roughness and Stiffness on Static Friction**<sup>1</sup> JEFFREY SOKOLOFF, Northeastern University — It is shown on the basis of simple scaling arguments that an interface between two three dimensional elastic solids, consisting of completely flat disordered surfaces, which interact with interatomic hard core interactions, will be in a weak pinning regime, and hence exhibit negligibly small static friction. It is argued, however, that the presence of roughness on multiple length scales can lead to much larger friction (i.e., static friction coefficients not too much smaller than 1), as is characteristic of most solid surfaces. This approach suggests a possible way of understanding why coatings of materials with high elastic constants are often excellent lubricants.

<sup>1</sup>Work supported by DOE

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Date submitted: 30 Nov 2005

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