

# Nanoscale friction in ambient conditions

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**ABSTRACT:** Macroscopic friction involves interaction between many asperities of two surfaces in contact. After the invention of an atomic force microscope (AFM), the physics of friction can be studied at a single-asperity level. While most of such studies are performed in ultrahigh vacuum, friction in ambient conditions is more relevant to our everyday life. In this talk, our results of AFM friction measurements on an amorphous glass and crystalline mica surfaces in ambient conditions will be presented. While friction increases with normal load, it may either increase or decrease with the puling velocity.

Furthermore, no measurable difference between static and kinetic friction was detected, and no stick-slip character of the tip motion was observed for both surfaces. These experimental findings strongly suggest that AFM friction in ambient conditions is produced by water bridges between the AFM tip and the surface. A version of the mechano-kinetic model is introduced that reproduces the experimental results both qualitatively and quantitatively.

**ALL ARE WELCOME!**