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Mechanical Non-equilibrium —Nanofriction

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I plan to discuss, based on theory and simulations in our group, examples of nanofriction as a mechanical case of non-equilibrium. One question will be what information even such a non-invasive tool could reveal about phenomena that are going on inside the sliders or within an interposed lubricating film. The accent is on the physics and not on tribology, considering instances where friction and dissipation could anticipate experiments exploring some extreme frictional situations [1-3]; others where it could describe the frictional signature of phase transitions [4-10], or the effect of external perturbations such as electric fields [11], or else the effect of time-periodic amplitude modulations of the corrugation potential [12]. These and other examples [13-15] suggest that nanofriction and AFM dissipation could in some cases provide a sort of spectroscopic tool for the blind man.

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