Physics Colloquium

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Friction, Brownian motion, and energy dissipation mechanisms in adsorbed molecules and molecularly thin films: Heating, Electrostatic and Magnetic Effects*

Friday, March 20, 2:30 p.m.
210 Robeson Hall

In the study of friction at the nanoscale, phononic, electrostatic, conduction electron and magnetic effects all contribute to the dissipation mechanisms [1,2]. Electrostatic and magnetic contributions are increasingly alluded to in the current literature, but remain poorly characterized. I will first overview the nature of these various contributions, and then report on our observations of magnetic and electrostatic contributions to friction for various systems in the presence and absence of external fields. I will also report on the use of a quartz crystal microbalance (QCM) with a graphene/Ni(111) electrode to probe frictional heating effects in Kr monolayers sliding on the microbalance electrode in response to its oscillatory motion. [3]


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