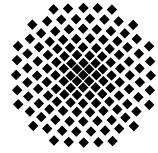


# Stuttgarter Physikalisches Kolloquium

Max-Planck-Institut für Intelligente Systeme  
Max-Planck-Institut für Festkörperforschung  
Fachbereich Physik, Universität Stuttgart

Ansprechpartner: Dr. Michael Hirscher  
E-Mail: hirscher@is.mpg.de  
Telefon: 0711 - 689-1808



Dienstag, 3. Mai 2016

17.15 Uhr

Hörsaal 2 D5

Stuttgarter Max-Planck-Institute, Heisenbergstraße 1, 70569 Stuttgart-Büsnau

Gastgeber: Prof. Siegfried Dietrich, Max-Planck-Institut für Intelligente Systeme, Telefon: 0711 - 689-1920

## Nanofriction: Physics, Simulation, and Theory

**E. Tosatti** (\*)(\*\*)

SISSA, ICTP, and CNR-IOM Democritos, Trieste, Italy

### Abstract

I plan to discuss, by reviewing theory and simulations done in our group, the question of what information could a non-invasive tools such as wear-free nanofriction or nanomechanical dissipation reveal about the phenomena that may be going on inside frictional sliders. The accent is on the physics and not on tribology, considering instances where friction simulations could anticipate experiments under extreme conditions of temperature and speed; others where they explore the effects of phase transitions; or the consequences of external perturbations such as electric fields on ionic lubricants; or the mechanical Shapiro steps caused by time-periodic amplitude modulations of the corrugation potential. These and other examples suggest that nanofriction and Atomic Force Microscope mechanical dissipation could in some cases provide a sort of spectroscopic tool for the blind man. Some among the important theory developments that are still waiting to be broached will also be mentioned if there is time. [1] A. Vanossi, et al., Rev. Mod. Phys. 85, 529 (2013).

(\*) In collaboration with A. Benassi, O. Brovko, R. Capozza, Y. Crespo, R. Guerra, D. Mandelli, N. Manini, E. Panizon, F. Pellegrini, G.E. Santoro, A. Vanossi, T. Zanca.

(\*\*) ERC Advanced Grant No. 320796 MODPHYSFRICT