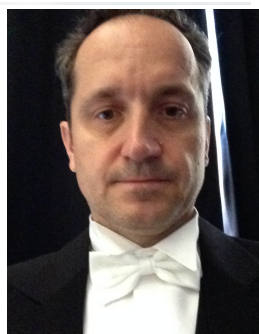


Colloquium Cukrovarnická

**V pondělí dne 18. září 2017 v 15:00 hod.
ve Fyzikálním ústavu Cukrovarnická v seminární místnosti
(budova A, 1. patro)**

Exploring structural and electronic properties of molecules on surfaces



Pavel Jelínek

Fyzikální ústav AV ČR

Implementation of fully functional devices based on the concept of Molecular electronics depends strongly on our ability to characterise, control and exploit properties of single molecules on surfaces. Scanning probe technique offers the unique possibility to tackle these goals. As a proof, we will present recent achievements accomplished in Nanosurf Lab. First, we will employ high-resolution AFM/STM imaging [1] to demonstrate chirality transfer during on-surface chemical reactions [2]. This control opens a new way of expressing 2D chirality in so far unexplored types of organic-inorganic chiral surfaces.

Second, we will show presence of piezoelectric effect on single helical molecules on surfaces. Namely force spectroscopies measured on single helicene molecules reveal strong bias-induced deformations. We corroborate the experimental evidence by the total energy DFT simulations.

Finally, we will report for first time a controlled single electron transfer within a single molecule between different redox states. We also succeed to control the multiple charge states. The experimental evidence is corroborated with a theoretical model simulating response of a dynamically oscillating AFM probe to temporal changes of force due to the charging effects of molecules on surface.

[1] P. Jelínek, J. Phys. Cond. Mat. 29, 343002 (2017)

[2] O. Stetsovych et al., Nat. Chemistry 9, 213 (2017)
