

SINGLE MOLECULAR DEVICES

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Low-temperature UHV Scanning Tunnelling Microscopes are nowadays not only microscopes but tools at the nanoscale allowing manipulation of atoms and molecules, sub-molecular spectroscopy experiments, chemical activation etc...It opens the way to new measurements, new researches on single molecules with exceedingly high accuracy and control. To carry out such experiments, specific molecules have to be designed [1]. In this presentation, we will introduce series of molecular devices devised for studying electronic and mechanical properties at the single molecular level. For instance, molecular devices designed to trap and move metallic atoms (Fig 1) [2], to perform switching and conformational changes [3] or to demonstrate a rack-and-pinion mechanism will be presented [4].

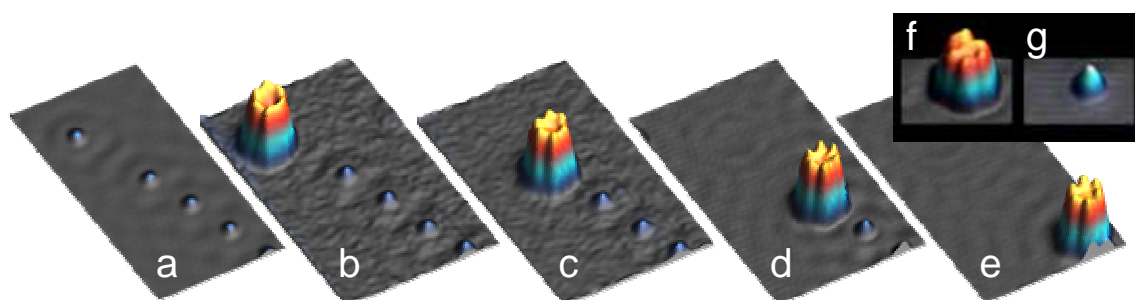


Fig.1. A molecular "Hoover" able to trap and move metallic atoms on a surface

References:

- 1 F. Moresco and A. Gourdon, *Proc. Natl. Acad. Sci. USA* 8809 (2005) 102.
- 2 L. Gross, K.-H. Rieder, F. Moresco, S. Stojkovic, A. Gourdon and C. Joachim, *Nature Materials* 892 (2005) 4.
- 3 L. Grill, K.-H. Rieder, and F. Moresco, S. Stojkovic, A. Gourdon, and C. Joachim *Nanoletters* 12(6), (2006) 2685.
- 4 F. Chiaravalloti, L. Gross, K.-H. Rieder, S. M. Stojkovic, A. Gourdon, C. Joachim, and F. Moresco *Nature Materials* 6 (2007) 30.