Pico-Inside

Highlights

Computing inside a single molecule using atomic scale technologies

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Publications

- A NOR-AND quantum running molecule logic gate
  N. Renaud, M. Ito, W. Yen, M. Hliwa, M. Saeys and C. Joachim
  Chem. Phys. Lett., 472, 74 (2009)
- Conductance of a Single Conjugated Polymer as a Continuous Function of its Length
  L. Lafferentz, F. Ample, H. Yu, S. Hecht, C. Joachim and L. Grill,
  Science 323, 1193 (2009)
- Nanofabrication of PTCDA molecular chains on rutile TiO2 (011)-(2x1) surfaces
  A. Tekiel, S. Godlewski, J. Budzioch and M. Szymonski
  Nanotechnology 19 (2008) 495304
- Molecular assemblies grown between metallic contacts on insulating surfaces
  Th. Glatzel, L. Zimmerli, S. Koch, S. Kawai and E. Meyer
  Appl. Phys. Lett. 94 (2009) 1
- Growth of ordered C60 islands on TiO2(110)
  F. Loske, R. Bechstein, J. Schütte, F. Ostendorf and M. Reichling, A. Kühnle, Nanotechnology 20 (2009) 065606
- Dihydride dimer structures on the Si(100):H surface studied by low-temperature scanning tunneling microscopy
  A. Bellec, D. Riedel, D. Dujardin, N. Rompotis and L. Kantorovich
  Phys. Rev. B, v. 78, No. 165302 (2008)
- Imaging molecular orbitals by scanning tunnelling microscopy on a passivated semiconductor
  A. Bellec, F. Ample, D. Riedel, G. Dujardin and C. Joachim
  Nano Lett. 9, 144 (2009)
- Designing molecular architecture to control diffusion and adsorption on insulating surfaces
  M. Watkins, T. Trevethan, M. L. Sushko and A. L. Shluger
  J. Phys. Chem. C 112 (11), pp. 4226-4231 (2008)

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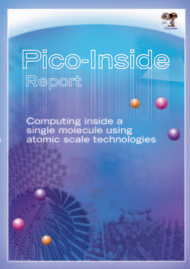

Scientific Highlights

- The first realistic NOR-AND quantum molecule logic gate was released with its associated tools to design its planar surface implantation at the surface of a semi-conductor.
- Long molecular chains and islands are now assembled and imaged at semi-conductor and insulator surfaces to prepare this surface implantation using new developments in surface chemistry and in NC-AFM microscopy. As a function of its length, the conductance of a single long conjugated molecular chain was measured using the STM tip as a second electrode.
- Planar interconnection of a single molecule on a passivated semi-conductor surface is in preparation with the understanding of dihydride dimer structures on the Si(100):H surface together with the STM imaging of pentacene molecular orbitals on this surface.

The Future

Atomic scale planar interconnection machines are under construction to observe and control how a molecule logic gate is running when interconnected to many surface atomic wires up to the macroscopic scale.