School of Nano Science

A course on

Nanoarchitectonics: architecture and design of Atomic Scale Logic Gates

Invited Speaker:

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Abstract

Continuous miniaturization of electronic circuits results in the nanometer-scale design of modern devices and integrated circuits engraved on the surface of a semiconductor solid. Nowadays, the development of integrated electronic circuits has approached size limitations due to quantum effects affecting the circuit's performance . The continuation of this miniaturization requires alternative approaches as compared with solid state devices. The utilization of a single molecule per device in an electronic circuit is regarded as one of the most challenging and promising approaches. Recently, it has been demonstrated that a semiconductor surface passivated by a hydrogen layer can also electronically isolate the adsorbed molecule from the semiconductor substrate . A new solution had been proposed based on the use of surface atomic circuits constructed with surface dangling bonds (DBs) created for example upon atom by atom hydrogen desorption. To go further into the miniaturisation of atomic scale circuits and also to benefit from surface quantum state behavior , A method has been established in CEMES/CNRS group of Christian Joachim for the realization of the first prototype of a planar QHC (Quantum Hamiltonian Computing) Boolean logic gate constructed at the atomic scale on a Si(001):H surface

Wednesday, 8 Ordibehesht 95 (27 April, 2016), 9:30-12:00 am

Farmaniyeh Room A