



September 15th 2014 – 14:00
CFEL Seminar room IV 01.111 (Bldg. 99)

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NINT and University of Alberta, Physics

Towards building atom-scale circuitry on silicon

In 2009 we described how single atoms can serve as quantum dots (1). Because the atom is the smallest dot it provides widely spaced energy levels, allowing useful room temperature deployment in some situations. We demonstrated the essential building block of a quantum cellular automata circuit.

Over the intervening years we have pushed on to address all the many academic (for example, (2), (3))and practical challenges to deploying the atomic silicon quantum dots in real working ultra low power electronic circuitry.

- (1) Controlled Coupling and Occupation of Silicon Atomic Quantum Dots at Room Temperature, Phys. Rev. Lett. 102, 046805, (2009)
- (2) Single-Electron Dynamics of an Atomic Silicon Quantum Dot on the H-Si(100)-(2×1) Surface, Phys. Rev. Lett. 112, 256801, (2014)
- (3) Conductivity of Si(111)-(7×7): The Role of a Single Atomic Step, Phys. Rev. Lett. 112, 246802, (2014)

