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Computation in Small Structures

Don Eigler

IBM Fellow, Almaden Research Center, San Jose, USA

The scanning tunneling microscope (STM) can be used to build atomically-precise structures and investigate their physical and functional properties. A new class of STM-assembled nanometer-scale structures called "molecule cascades," will be presented, and it will be shown how they may be used to implement a general-purpose binary-logic computer where all of the circuitry is at the nanometer length scale.

Personal information:

Don Eigler is a physicist at IBM's Almaden Research Center in San Jose, California. His research is concentrated on creating and studying the physical properties of nanometer-scale structures. In 1989 Don demonstrated for the first time the ability to build structures at the atomic level by spelling out "I-B-M" with individual xenon atoms. Since then, his group's research has been aimed at extending basic knowledge about the physics of atomic-scale structures and exploring the potential for atomic-scale logic and data-storage technologies. The group's results include the invention of "quantum corrals," discovery of the "quantum mirage" effect, "molecule cascades," and demonstration of a fundamentally new way to transport information through a solid using the wave property of electrons. Don received both his bachelors and doctorate degrees from the University of California San Diego and was named its Outstanding Alumnus of the year in 1999. Don has been recognized for his accomplishments with numerous prizes including the Dannie Heineman Prize, the Newcomb-Cleveland Prize, the Nanoscience Prize and the Davisson-Germer Prize. He was named an IBM Fellow in 1993, the highest technical honor in the IBM Corporation.

Montag, 13. Oktober 2003, 16:30 Uhr
(ab 16:00 Uhr Kaffee)
Technische Universität Wien, Freihaus,
Hörsaal 5 (Turm A, grüner Bereich, 2. Stock),
Wiedner Hauptstr. 8-10, A-1040 Wien

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