Microscopy – Nanoscale Commuting

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Oak Ridge National Laboratory's Center for Nanophase Materials Sciences, or CNMS, contributed to a groundbreaking experiment published in Science that tracks the real-time transport of individual molecules.

A team led by the University of Graz, Austria, used unique four-probe scanning tunneling microscopy, or STM, to move a single molecule between two independent probes and observe it disappear from one point and instantaneously reappear at the other.

An international research team used scanning tunneling microscopy at ORNL to send and receive single molecules across a surface on an atomically precise track.

The STM, made available via the CNMS user program, operates under an applied voltage, scanning material surfaces with a sharp probe that can move atoms and molecules by nudging them a few nanometers at a time. This instrument made it possible to send and receive dibromoterfluorene molecules 150 nanometers across a silver surface with unprecedented control.

"The project showcases precision instrument capabilities at the atomic level that open new frontiers in controllable molecules, or molecular machinery, for CNMS users," said ORNL's An-Ping Li.

Read the original article on Oak Ridge National Laboratory (ORNL).