CENTER FOR NANOSCALE SCIENCE AND TECHNOLOGY
University of Illinois at Urbana-Champaign

CNST RELEASE

Novel Ultra-Clean Deposition Technique for Carbon Nanotubes

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URBANA, Ill. University of Illinois at Urbana-Champaign **Center for Nanoscale Science and Technology (CNST)** researchers Peter M. Albrecht and Joseph W. Lyding have developed a novel ultra-clean deposition technique for carbon nanotubes.

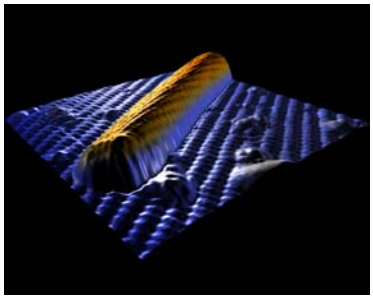

Figure. Three-dimensional rendering of a 10×10 nm^2 STM topograph showing a single-walled carbon nanotube physisorbed onto a UHV-prepared Si(100)-2×1:H surface. (Albrecht and Lyding, **APL 83, 5029 (2003).).**

Carbon nanotubes, which can be envisioned as molecular–scale quantum wires formed by rolling up a single sheet of graphite into a seamless, high-aspect-ratio cylinder, show tremendous potential as candidates for future high-speed nanoelectronic systems, especially if they can be integrated with silicon. UIUC researchers Peter M. Albrecht and Joseph W. Lyding made an important step in this direction by developing a novel ultra-clean technique for depositing carbon nanotubes onto silicon surfaces. In their method, the nanotubes are directly stamped onto a surface in dry form. “By avoiding the standard solution-based deposition, deleterious contamination is minimized, enabling accurate structural and electronic characterization”, said Albrecht, a graduate student at the Department of Electrical and Computer Engineering. Further explaining their technique, Lyding, a faculty member at the Department of Electrical and Computer Engineering said “our dry transfer technique for carbon nanotubes is compatible with technologically significant substrates, including silicon and gallium arsenide”. Albrecht and Lyding demonstrated atomic resolution imaging of nanotubes and their silicon support through use of a scanning tunneling microscope. Their work was carried out at the Beckman Institute for Advanced Science and Technology at the University of Illinois at Urbana-Champaign; and was reported in the 15 December 2003 issue of Applied Physics Letters.

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