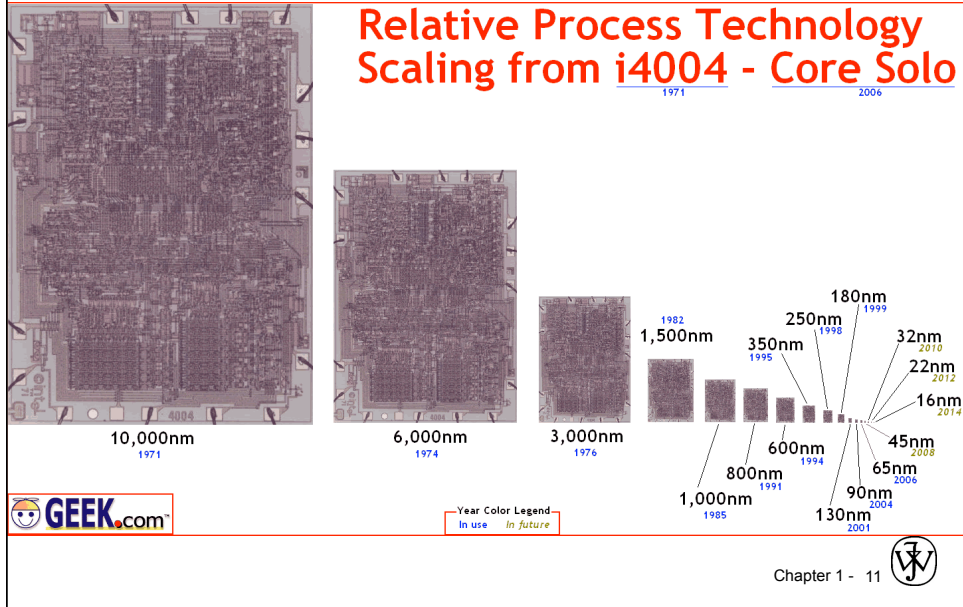


Reducing Size



Single Molecule Transistors

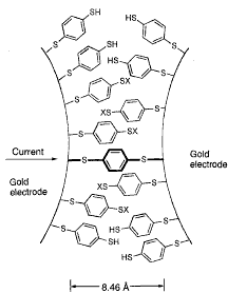
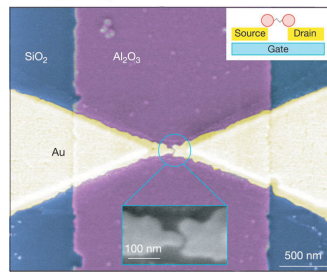
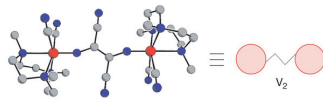
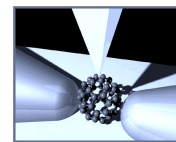


Fig. 3. A schematic of a benzene-1,4-dithiolate SAM between proximal gold electrodes formed in an MCF. The thiolate is normally H-terminated after deposition; end groups denoted as X can be either H or Au, with the Au potentially arising from a previous contact/retraction event. These molecules remain nearly perpendicular to the Au surface, making other molecular orientations unlikely (21).



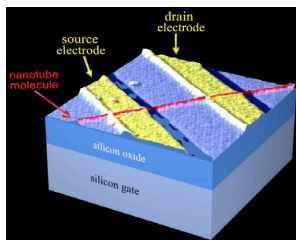
Nature 417, 725-729 (13 June 2002)



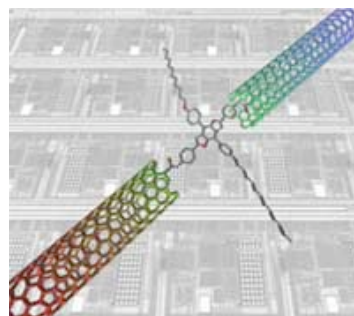
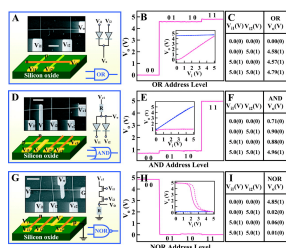
www.physics.mcgill.ca

M. A. Reed, C. Zhou, C. J. Muller, T. P. Burgin and J. M. Tour *Science*, Vol. 278, No. 5336 (Oct. 10, 1997), pp. 252-254

Nanotube/nanowire Transistors



Tans, S.J; Verschueren, ARM; Dekker, NATURE 393 49-52
Published: MAY 7 1998



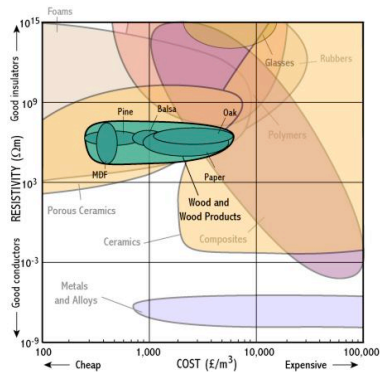
www.columbia.edu - Nuckolls

Science 9 November 2001, Lieber et al.

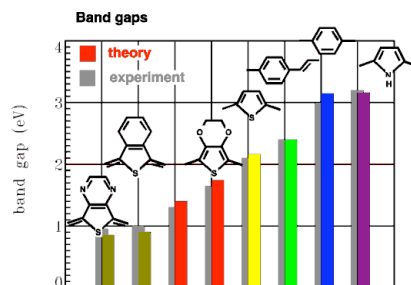
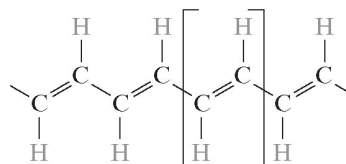
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Electrical Properties of Polymers



http://www-materials.eng.cam.ac.uk/mpsite/interactive_charts/resistivity-cost/NS6Chart.html

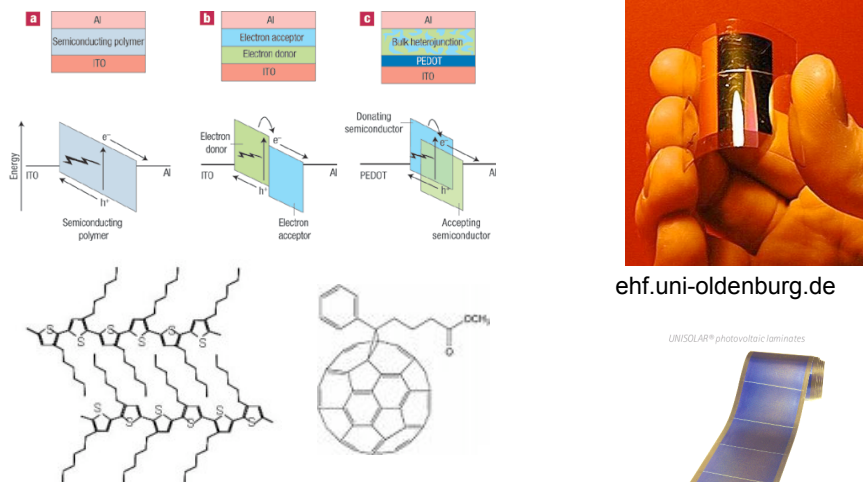


http://www.infochembio.ethz.ch/links/en/polymer_leitend.html

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Polymer Solar Cells



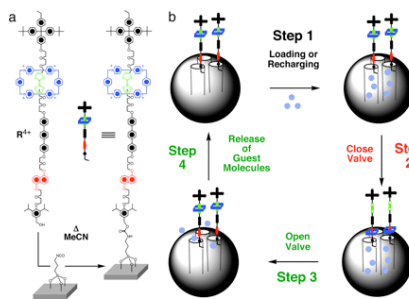
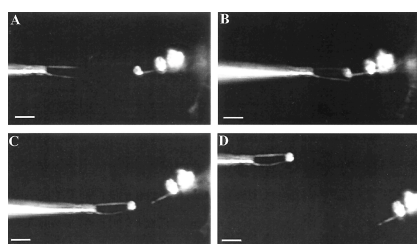
Nature Materials **5**, 675 - 676 (2006)

Photo courtesy of United Solar Oceanic, LLC

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Swallowing the surgeon

.....although it is a very wild idea, it would be interesting in surgery if you could swallow the surgeon

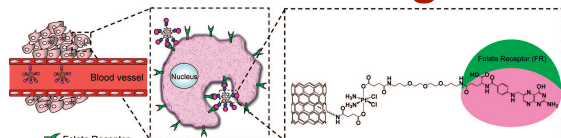


Kim, P; Lieber, *SCIENCE*, 286 , 2148-2150
Published: DEC 10 1999

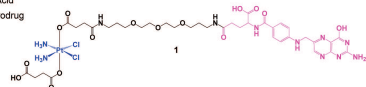
PNAS July 19, 2005 vol. 102 no. 29 10029-10034

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Swallowing the Surgeon

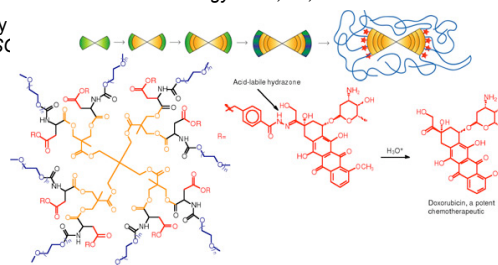


Folate Receptor
 Folic Acid
 Pt(IV) Prodrug



Shanta Dhar, Zhuang Liu, Jürgen Thomale, Hongjie Dai, and Stephen J. Lippard. "Targeted Single-Wall Carbon Nanotube-Mediated Pt(IV) Prodrug Delivery Using Folate as a Homing Device" *J. AM. CHEM. SOC.* **130**, 11467–11476, 2008

Lee, C. C.; Mackay, J. A.; Frechet, J. M. J.; Szoka, F. C. *Nature Biotechnology* **2005**, *23*, 1517-1526.

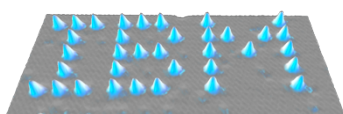


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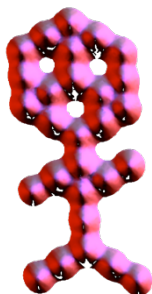


Arranging Atoms

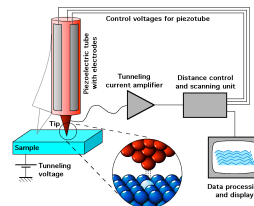
But I am not afraid to consider the final question as to whether, ultimately---in the great future---we can arrange the atoms the way we want;



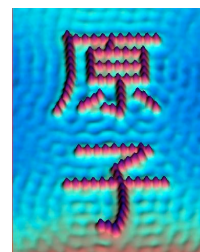
Xenon on Nickel (110)



Carbon Monoxide on Platinum (111)



www.iap.tuwien.ac.at



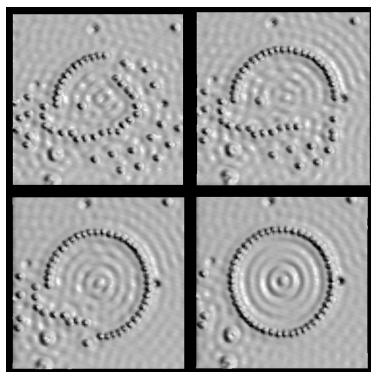
Iron on Copper (111)

www.almaden.ibm.com

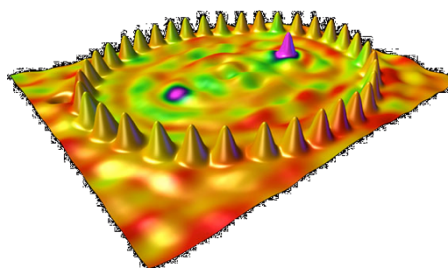
Chapter 1 -




Quantum Corrals



Crommie, Lutz, Eigler
www.almaden.ibm.com
Iron on Copper (111)



Manoharan *et al.*, Nature (2000)

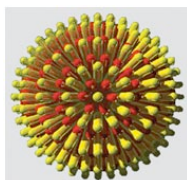
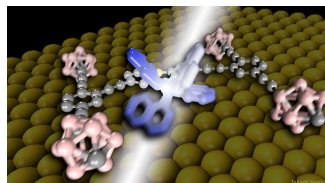
Chapter 1 - 19 

Ultimately, we can do chemical synthesis

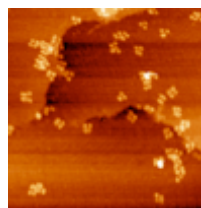
The chemist does a mysterious thing when he wants to make a molecule. He sees that it has got that ring, so he mixes this and that, and he shakes it, and he fiddles around. And, at the end of a difficult process, he usually does succeed in synthesizing what he wants.



nanocars



Quantum dots



Science 315, 358–361 (2007)

<http://www.jmtour.com> 

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