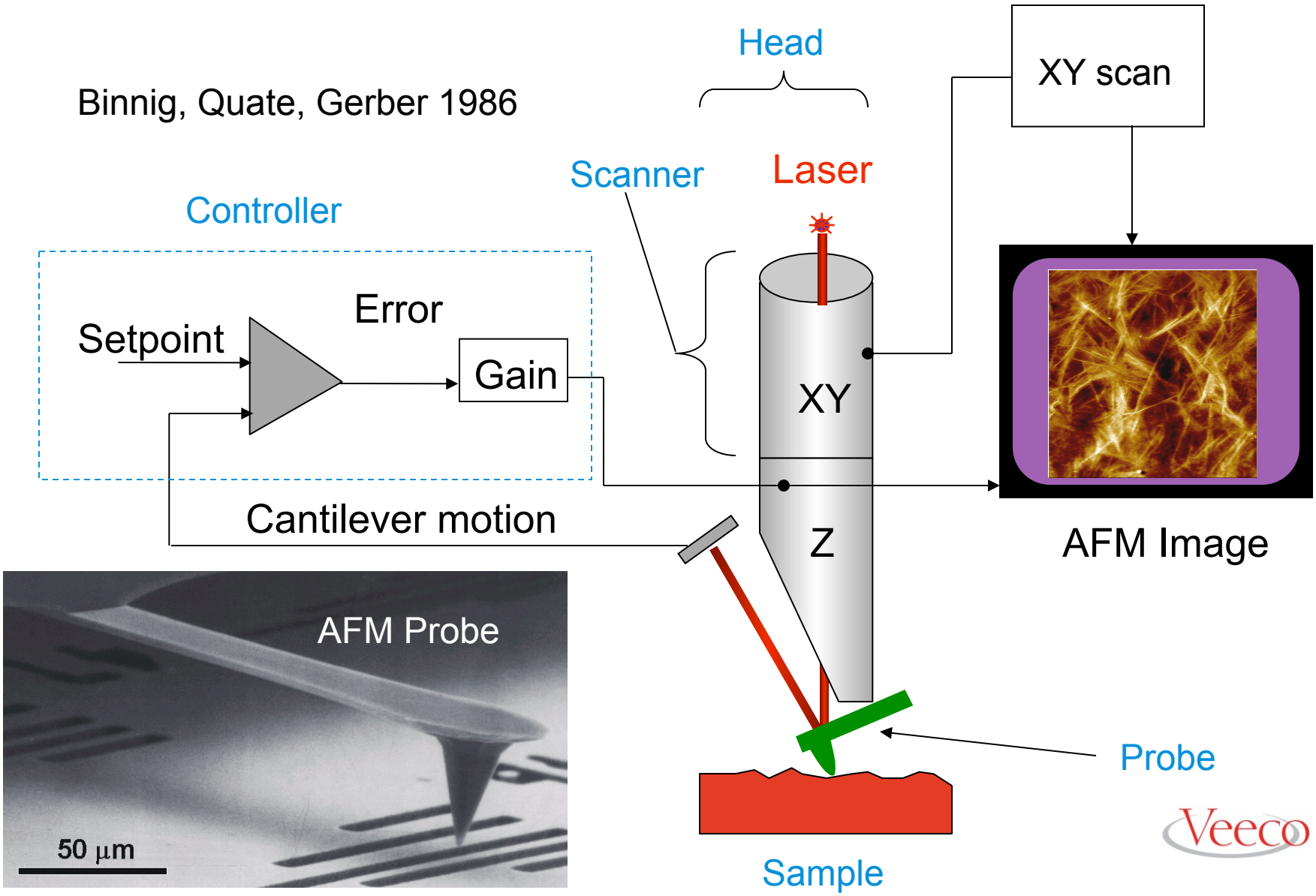
Simplified AFM schematic



Everyday products impacted by AFM

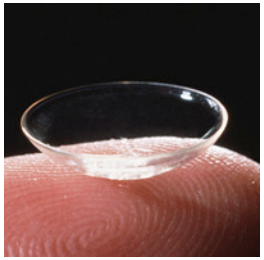
AFM measurements are key to enabling performance improvements in electronics and materials.



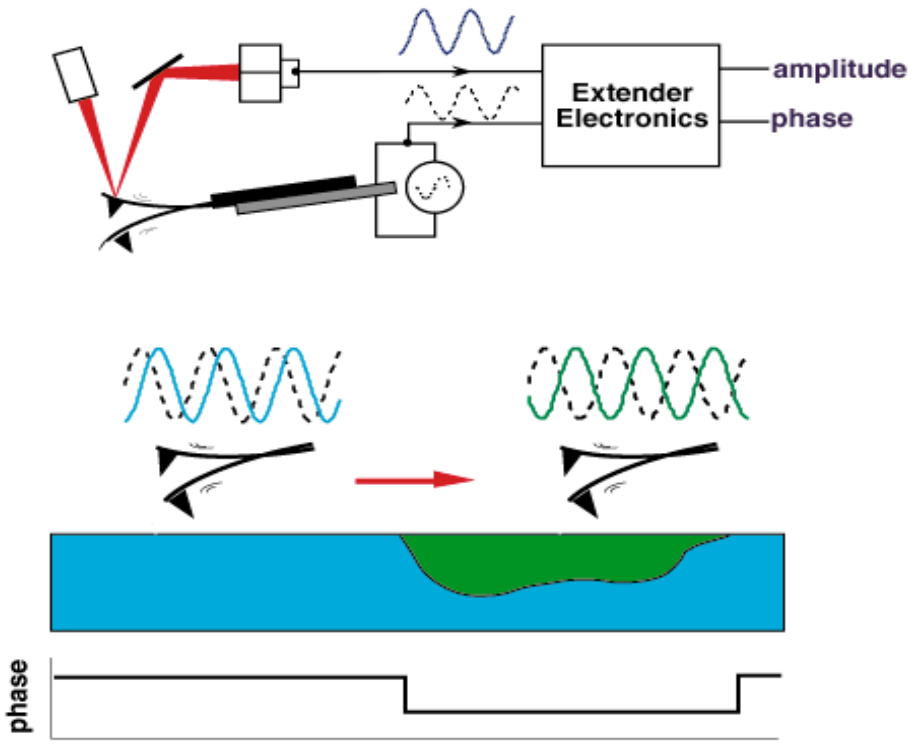




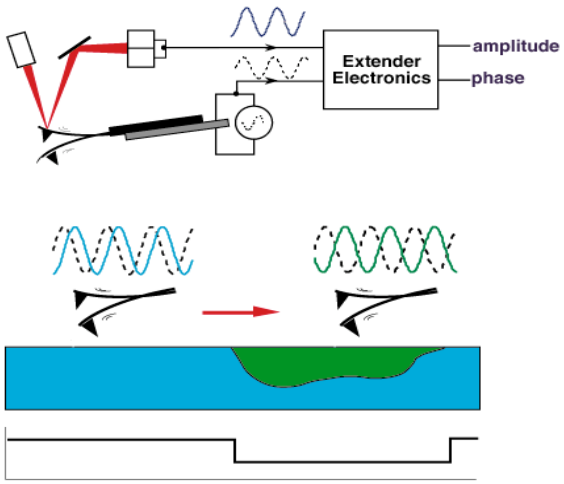


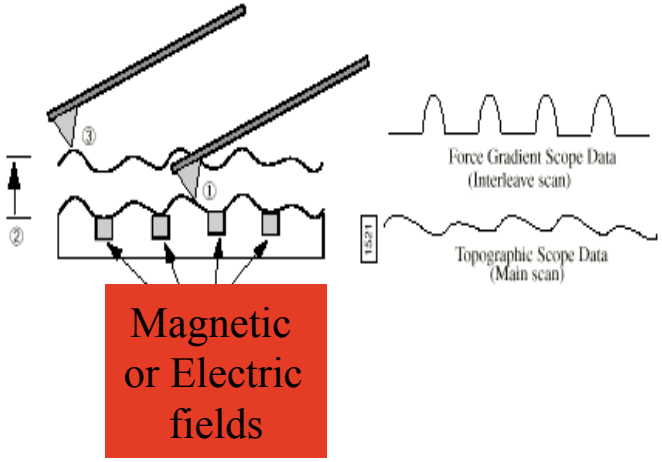



TappingMode, PhaseImaging



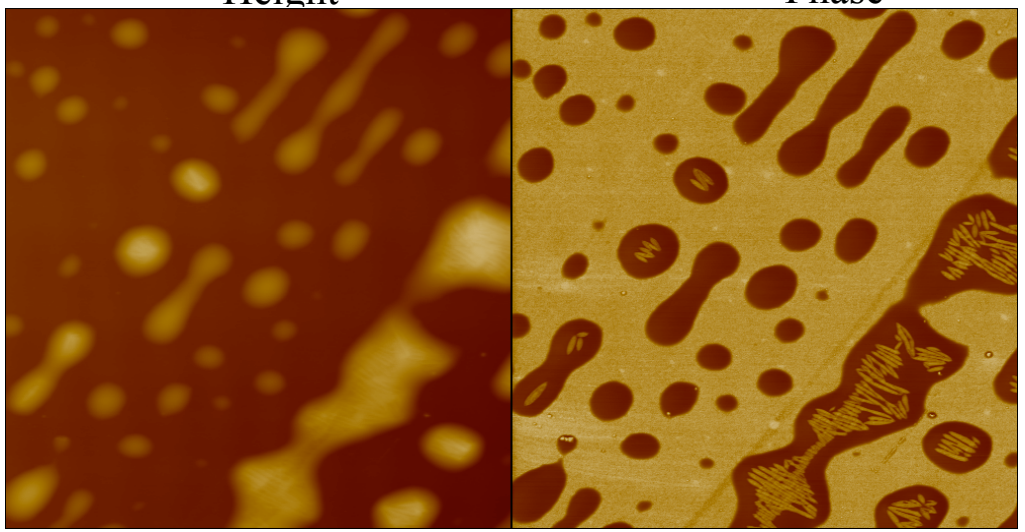
TappingMode, PhaseImaging & LiftMode





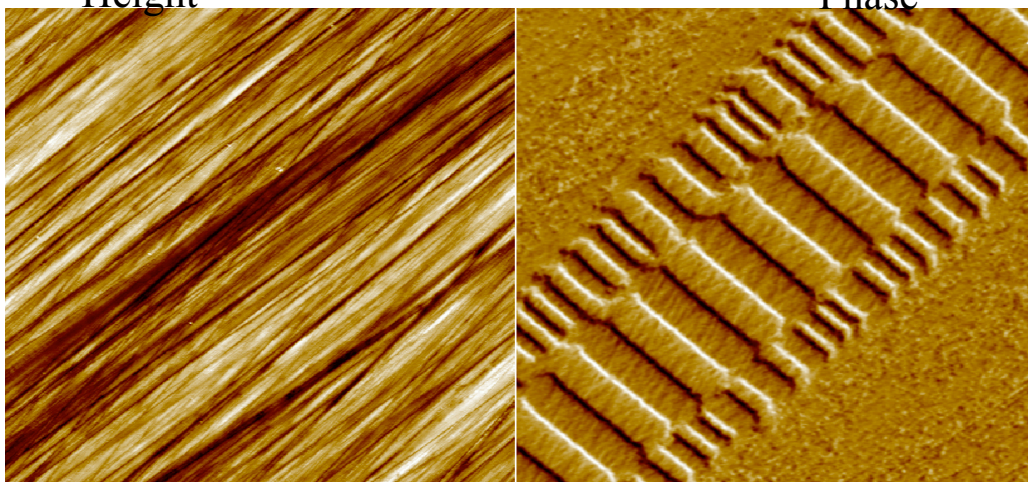
Patches of Polydiethylsiloxane on Si substrate

Height Phase



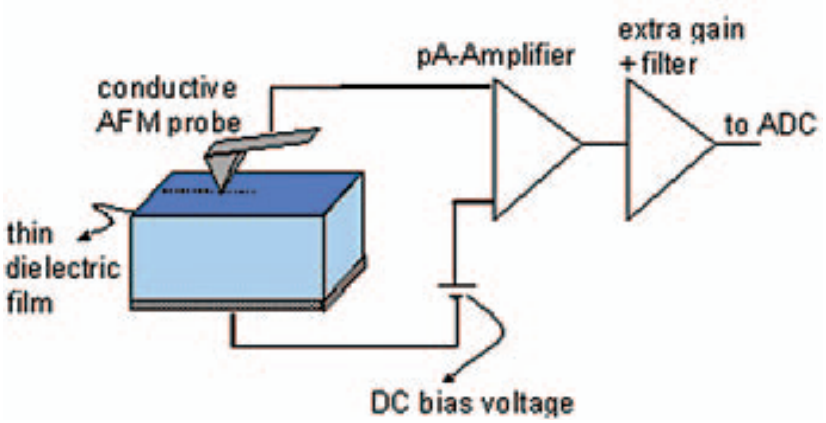
Tracks on a hard disk

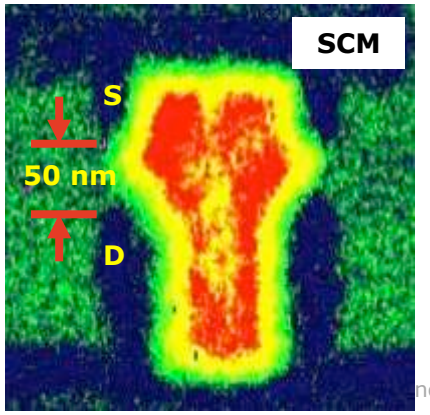
Height Phase

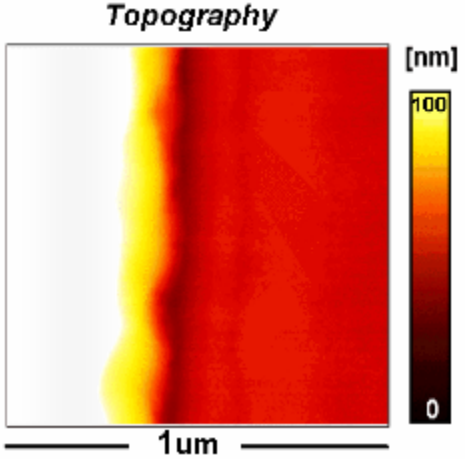


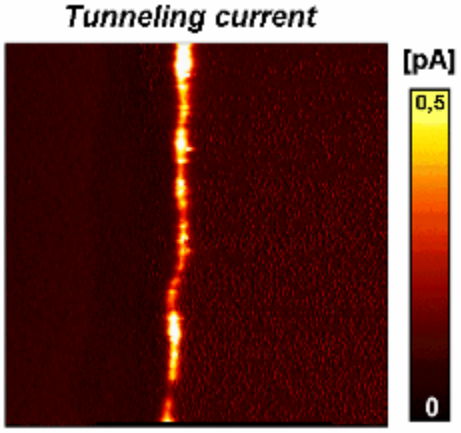
AFM electrical characterization techniques

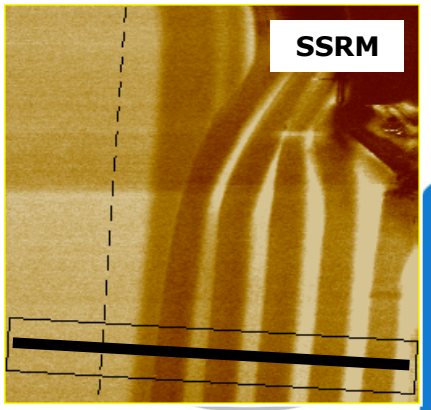
- SCM – Scanning Capacitance Microscopy
- SSRM – Scanning Spreading Resistance Microscopy
- TUNA/C-AFM
- Scanning Kelvin Microscopy



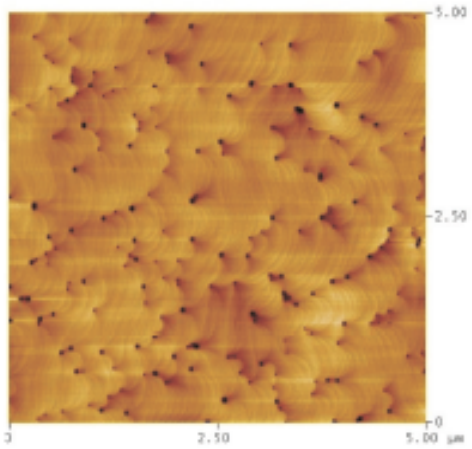


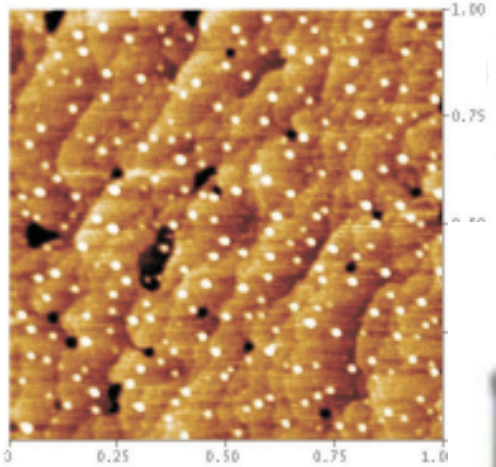


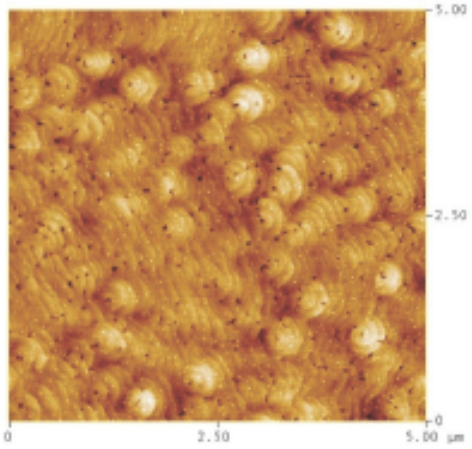


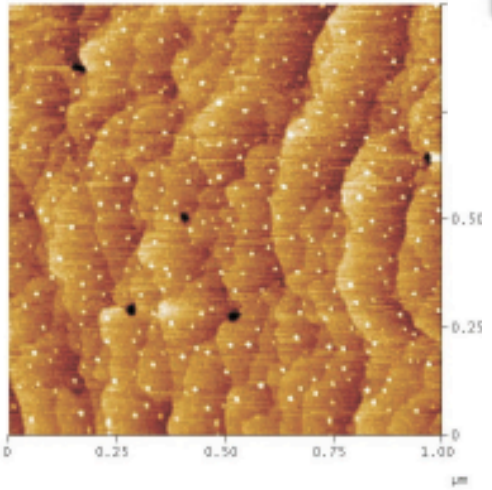


Gallium Nitride LEDs



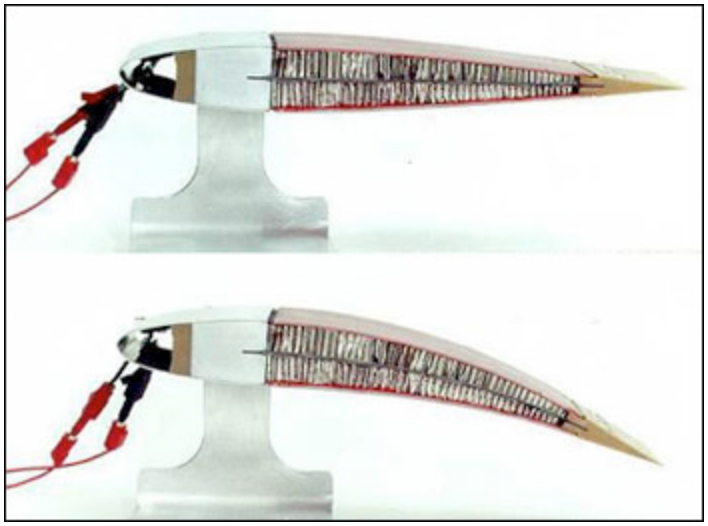






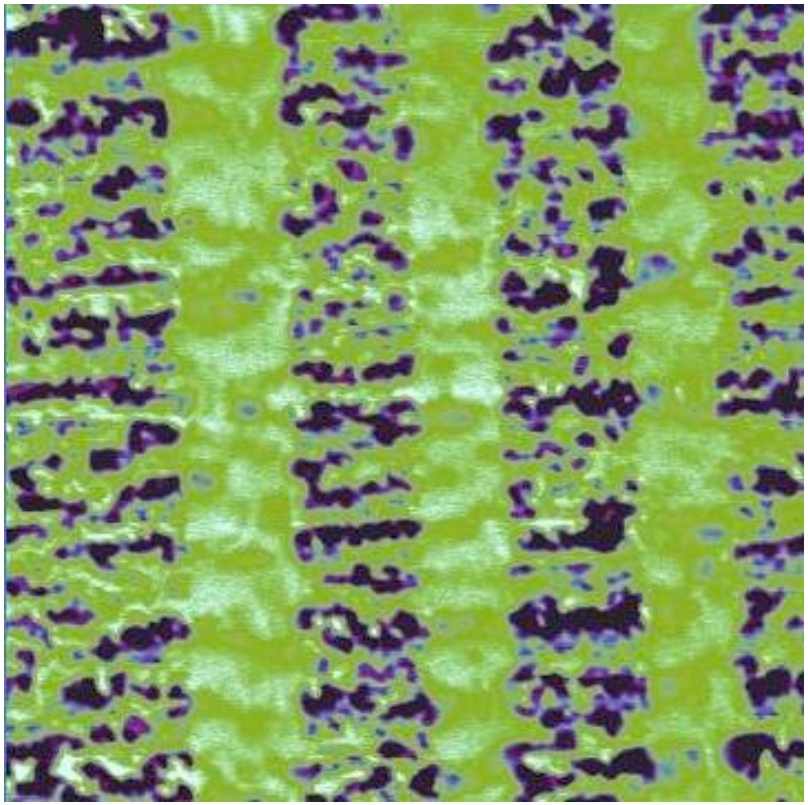
Magnetics—Shape memory alloys

Shape memory example



Continuum Dynamics Inc.

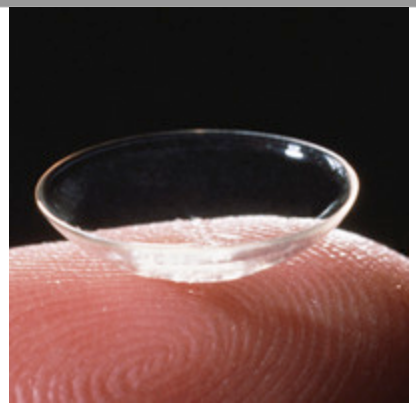
http://nanoarchitecture.net/article/?c=SmartMat-shape-memory

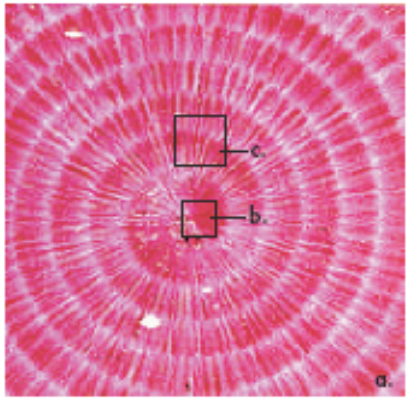


Magnetic Force Microscopy showing the underlying crystal orientation of a shape memory alloy (NiMnGa). The crystal orientation with the easiest axis of magnetization pointing out shows up as a dark band.
Courtesy of Linda Kenoyer, Zak Clark, Dr. Peter Mullner, Dr. William Knowlton, Dr. G Kostorz, Boise State University

Contact lenses

- Construction, care, comfort, contamination





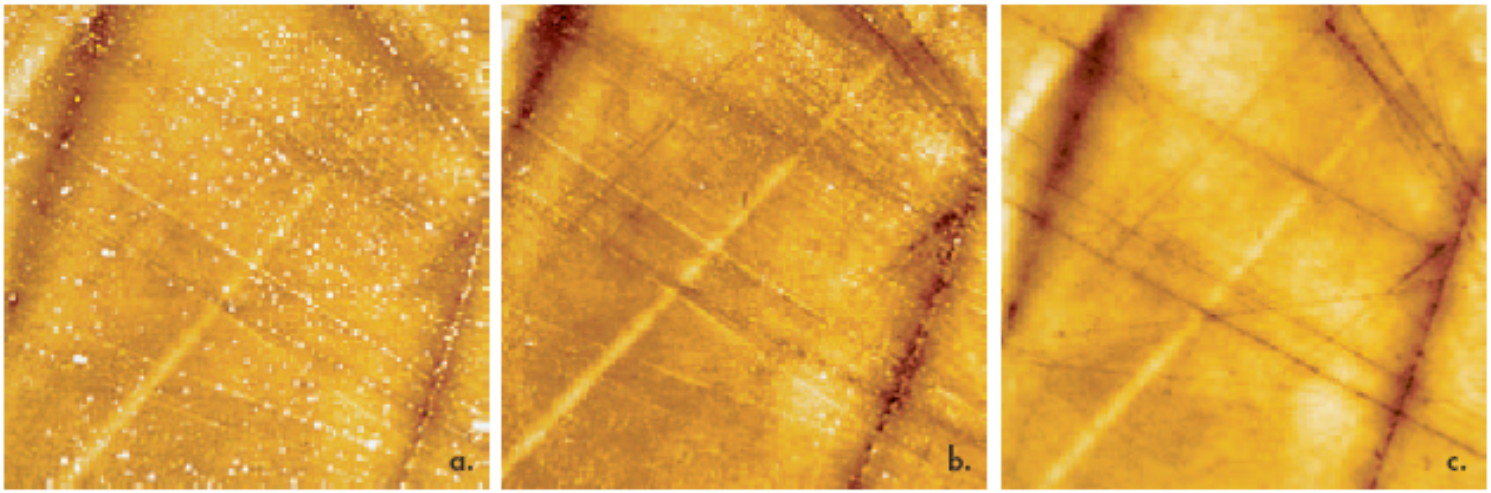
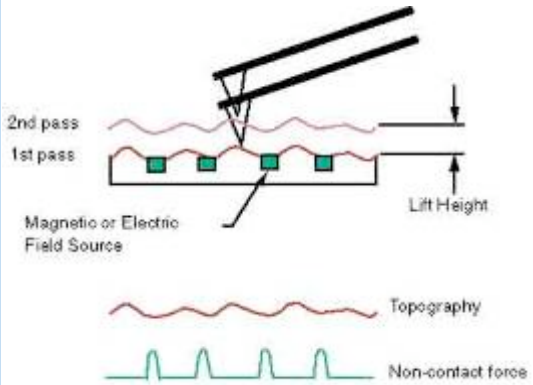
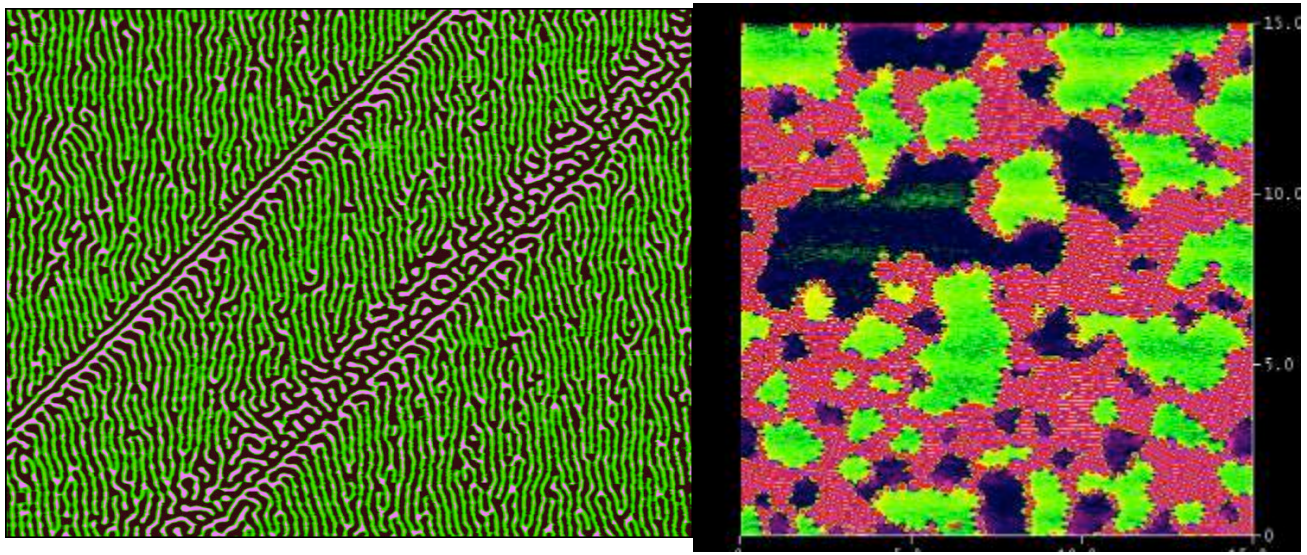


Figure 9. Series of AFM images of the same region on a used RGP lens in saline, (a) before cleaning, (b) after soaking in commercial cleanser, and (c) after soaking in cleanser and rubbing with latex glove. 30μm scans.

Magnetics

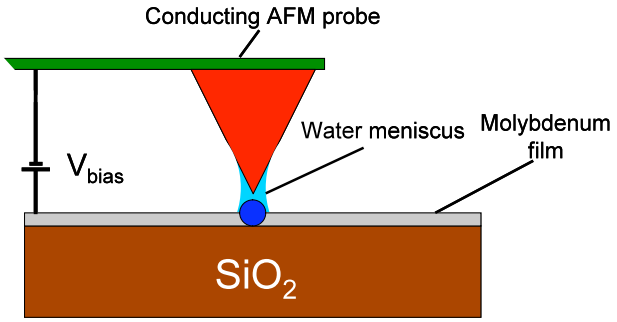




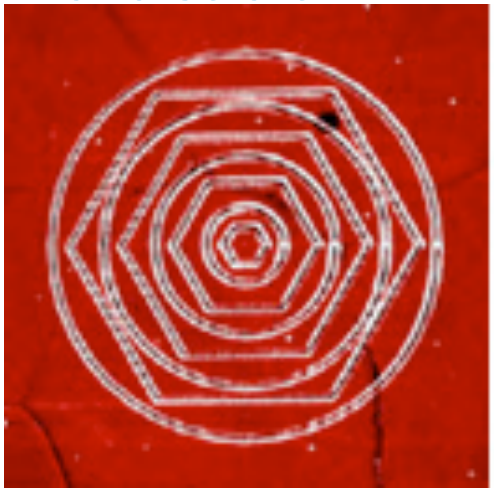
Olav Hellwig, Maggie Best and Eric E. Fullerton,
Hitachi Global Storage Techynologies. Scan Size: 15micronsx15microns

Probe based nanomanufacturing

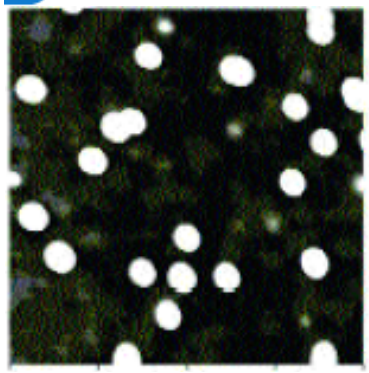
Nanolithography
Anodic oxidation

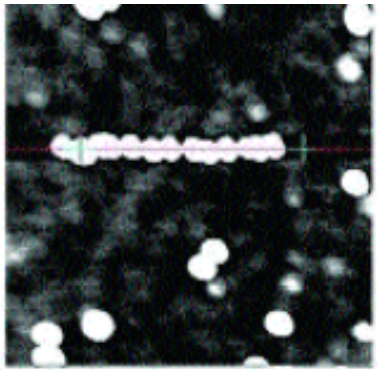


Nanomachining
Nano-scratch

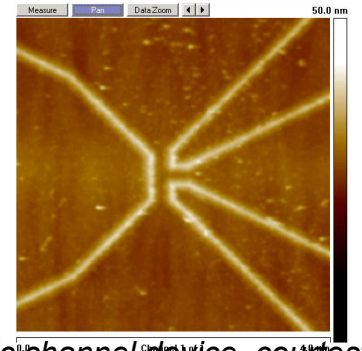


Nanomanipulation

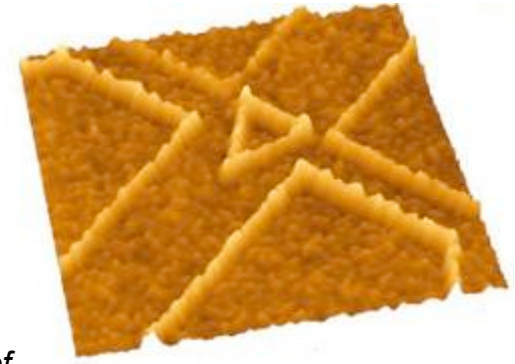




Nanoprototyping
Nanoexperimentation



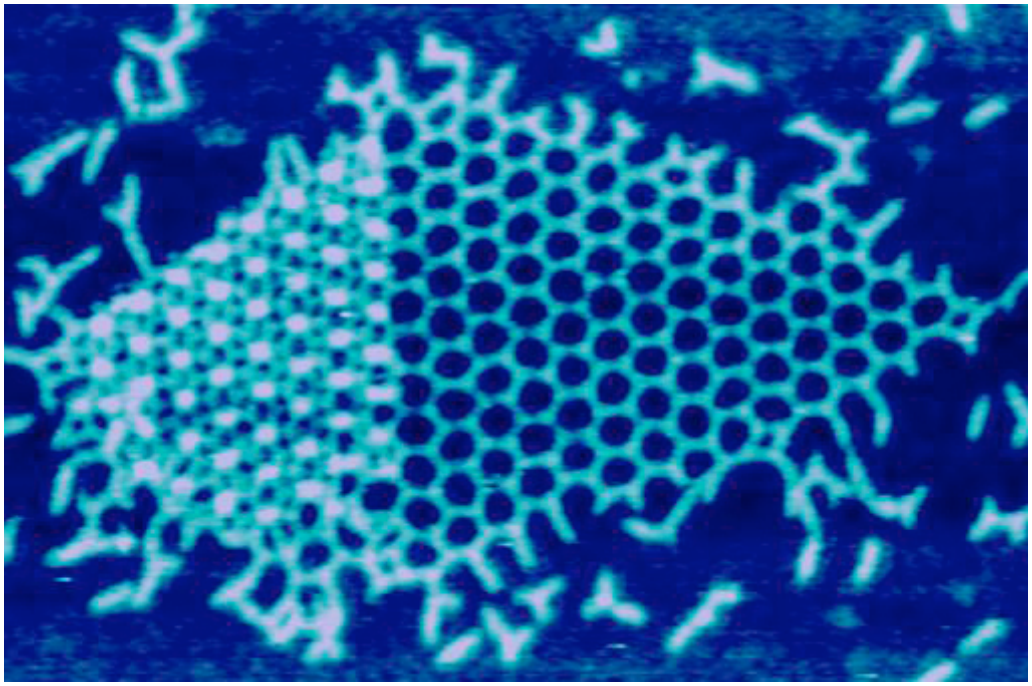
Ballistic channel device, courtesy of of G. Jones, M. Murphy, University of Cambridge



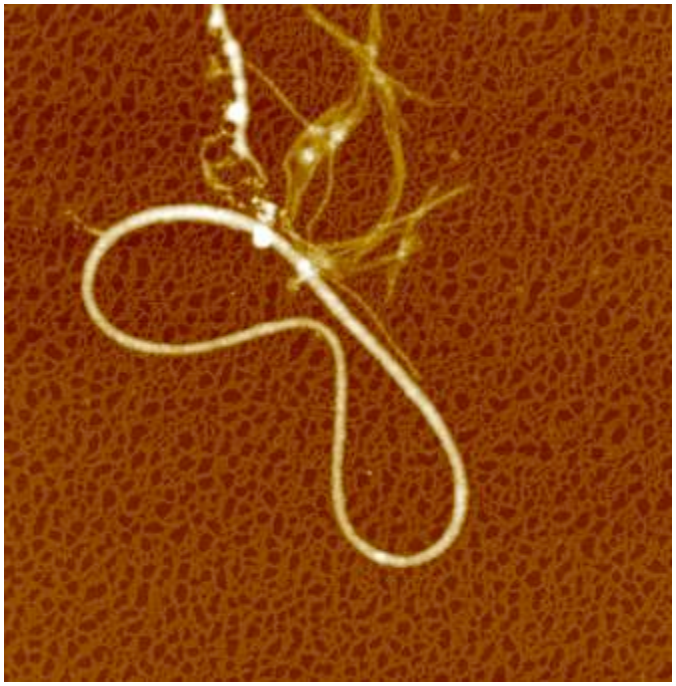
Ballistic rectifier
Aimin Song, University of Manchester

Biological self assembly

- Using DNA as a molecular building block

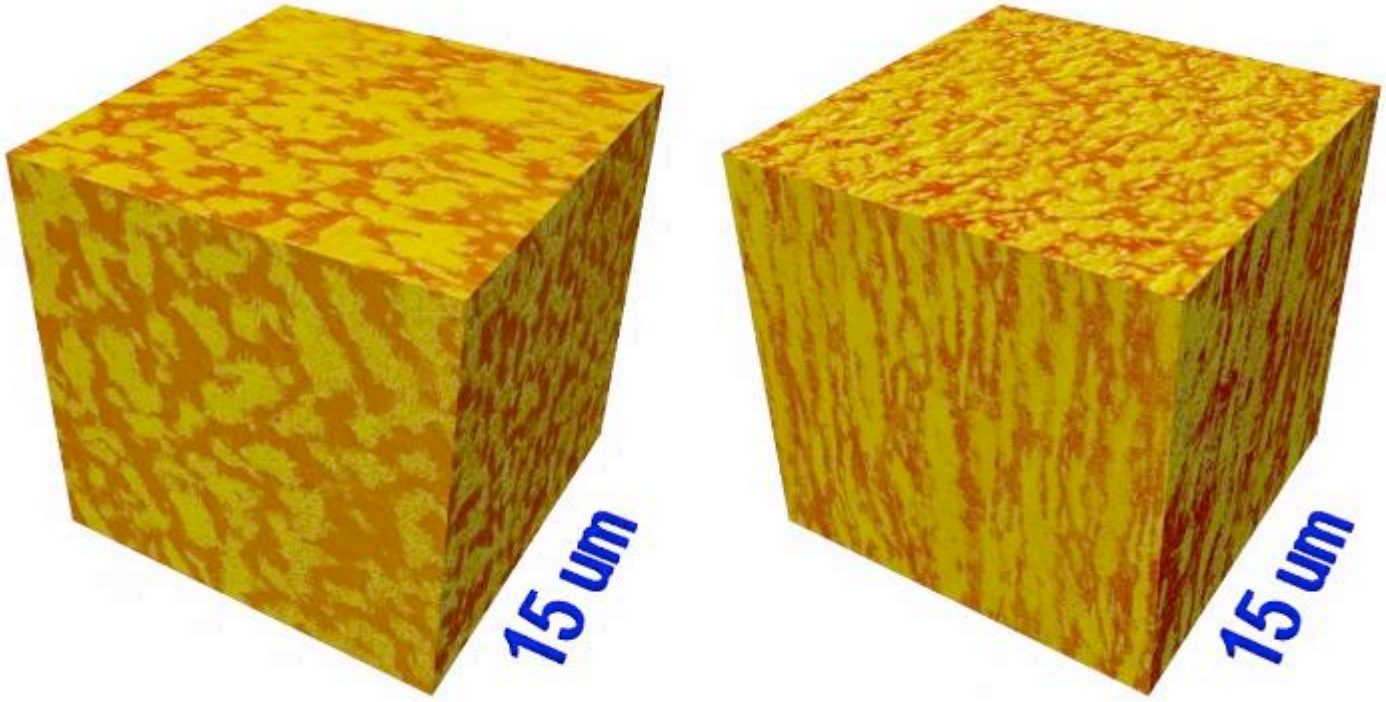


Single and double layers of a DNA hexagonal array.
Courtesy of Alexey Y. Koyfman, Sergei N. Magonov and Norbert O. Reich



A DNA nanotube self-assembled from many copies of a single palindromic sequence of synthetic oligonucleotide.
Courtesy of: T Sobey, M Otten, R Jungmann, F Simmel, Ludwig-Maximilians-Universität München, Germany

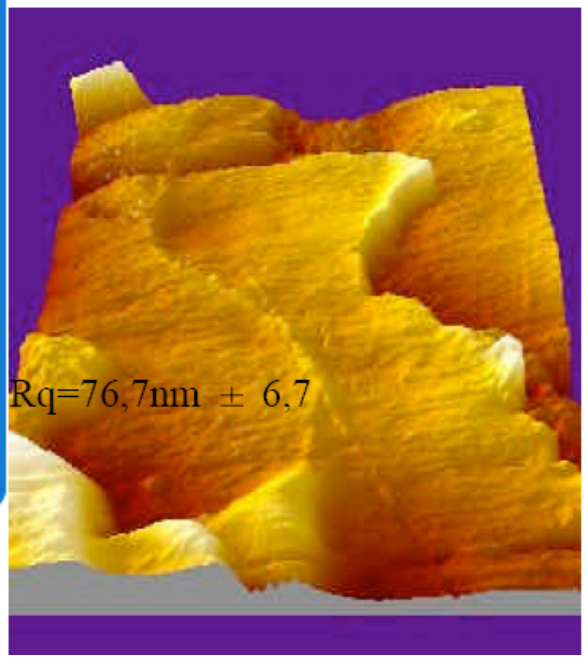
3D compositional mapping



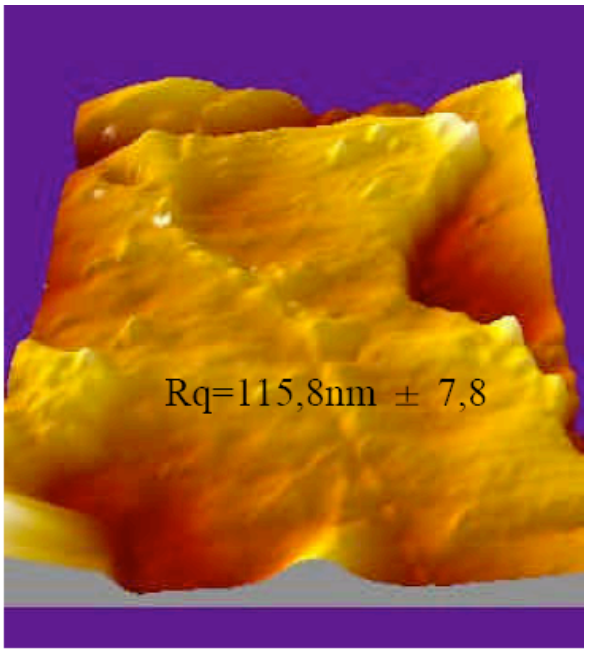
TappingMode AFM images of a polymer blend made on samples microtomed in three orthogonal directions. The two cubes reveal differences in the anisotropy between two positions in the sample.
Courtesty of: Børge Holme SINTEF Materials and Chemistry, Oslo.

Hair treatment research

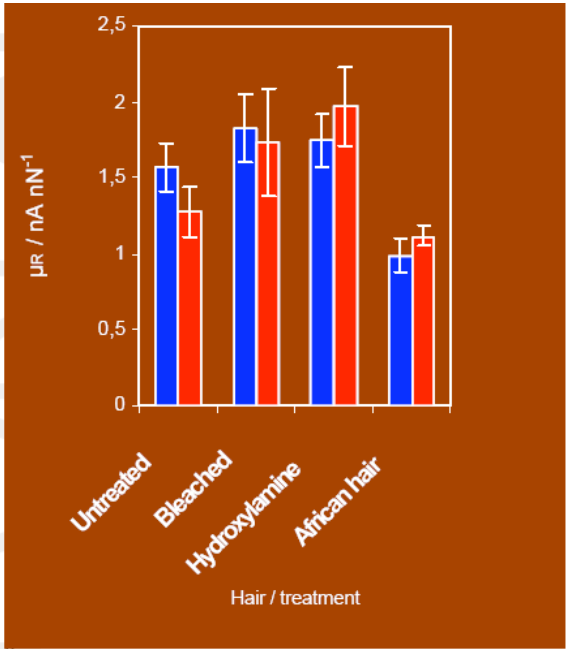
Before Treatment



After Treatment

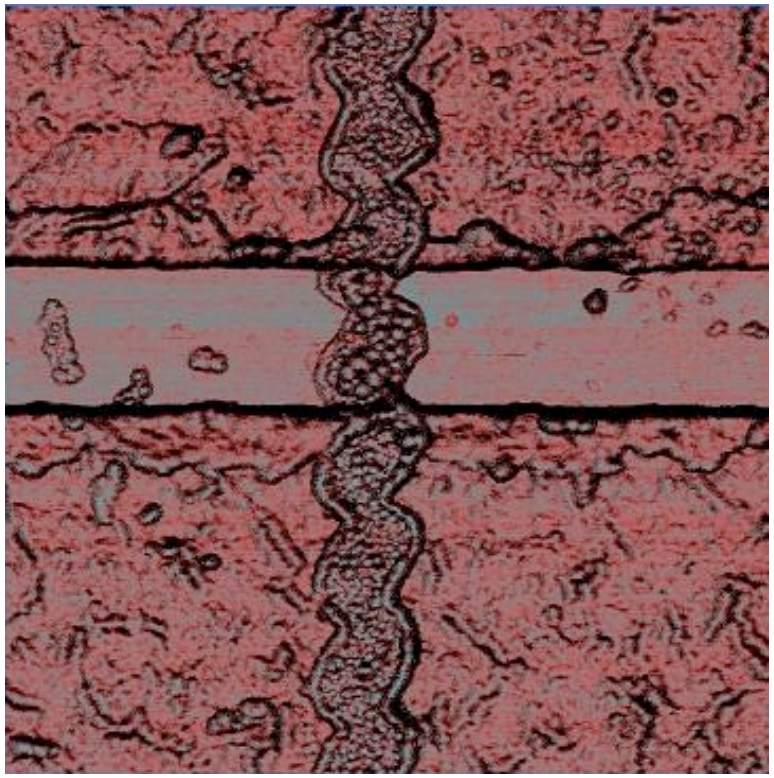


Friction Studies

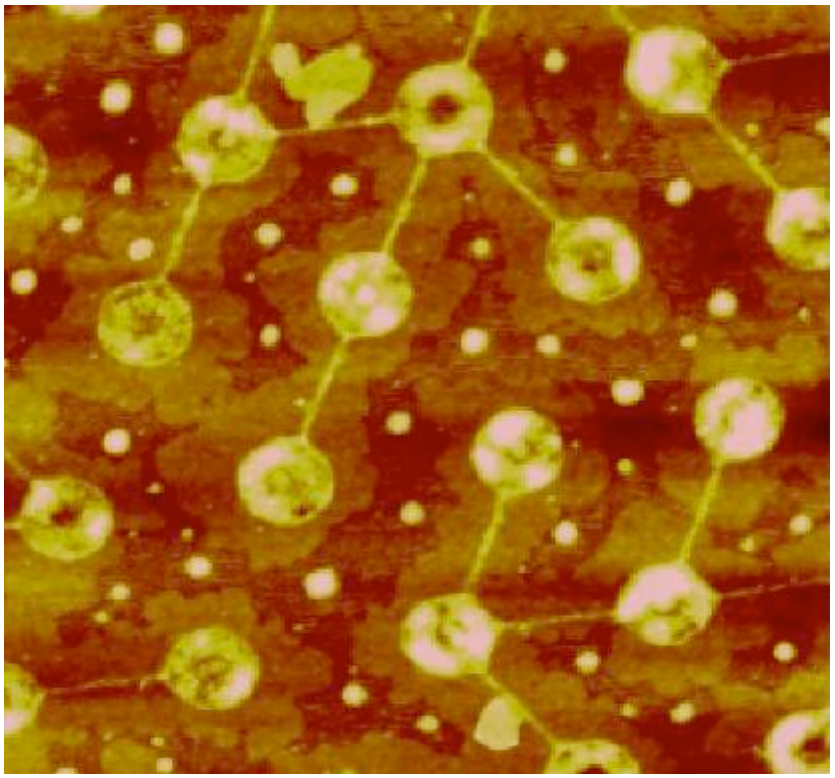


Data courtesy of Gustavo Luengo, L'Oreal Recherche

Nanoscale Interconnects



Zinc Oxide nanowire across a 330 nm gap in a gold test structure on silicon dioxide substrate
Image courtesy of J. Brotherton, Knowlton Research Lab/Boise State University



Interconnecting Ni lines and dots prepared by nanosphere lithography
Image courtesy of P Lemoine, P Yadav and A George

Veeco