

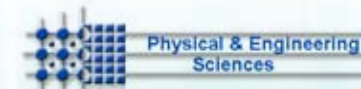
Nanowire Sensors

"Discovering and exploiting the unique properties of nanowires for sensing applications"

SAND2007-5965P



LABORATORY DIRECTED RESEARCH & DEVELOPMENT

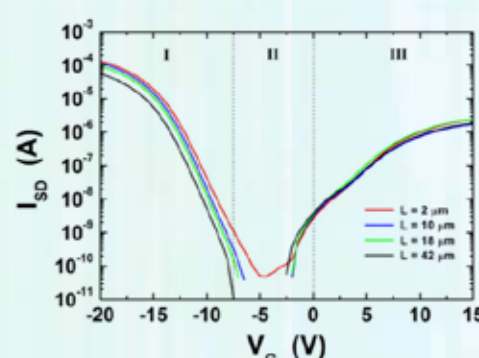
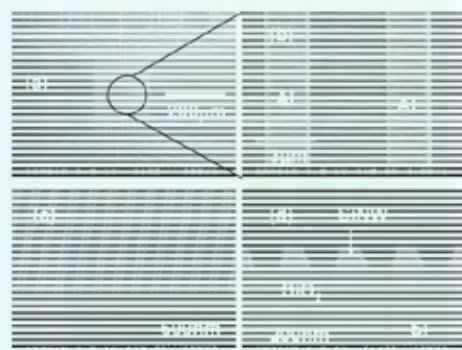


Sandia National Laboratories

8700 — François Léonard, Alec Talin, Paul Dentinger, Blake Simmons, David Robinson, Frank Jones

1800 — Nelson Bell, Tim Boyle, Bernadette Hernandez, Robin Sewell

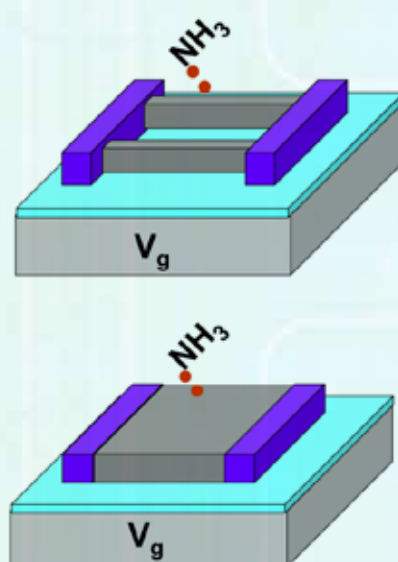
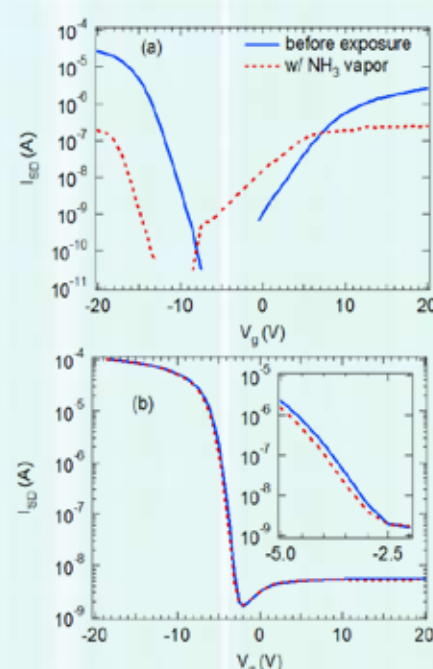
SILICON NANOWIRE ARRAYS



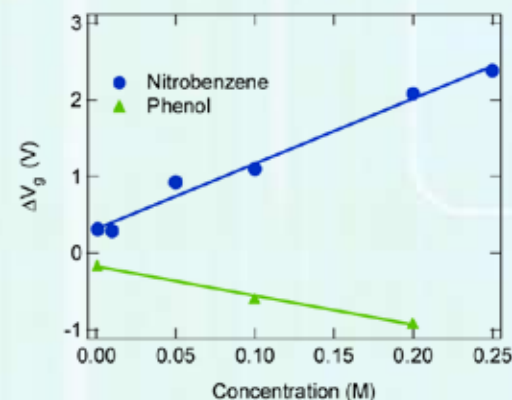
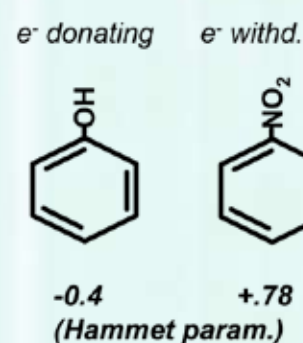
Large area, dense array of nanowires

Transistor action

Sensing more sensitive than thin film:

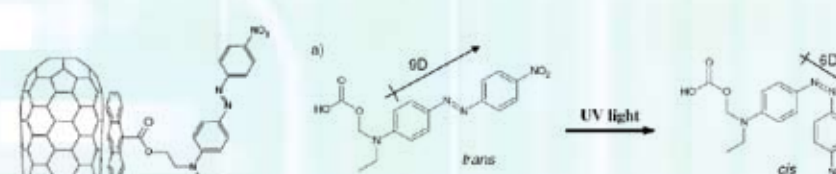
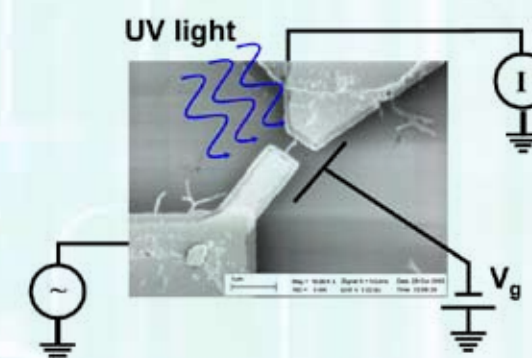


Sensing depends on analyte Hammett parameter

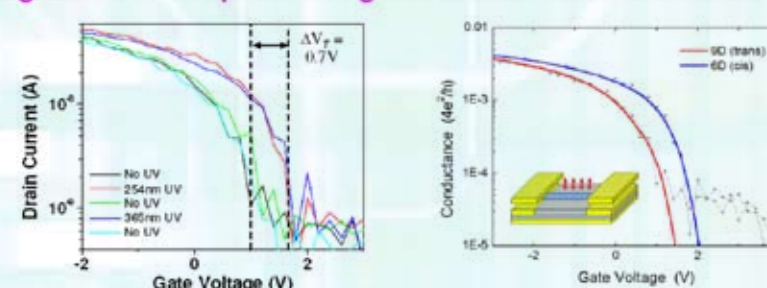


OPTICAL SENSING USING NANOTUBE/CHROMOPHORE HYBRIDS

(with M. Eriksson, P. Gopalan, Univ. of Wisconsin)



Light-induced dipole change causes shift in threshold voltage:



Modeling supports mechanism

Switching is repeatable for hundreds of cycles:

