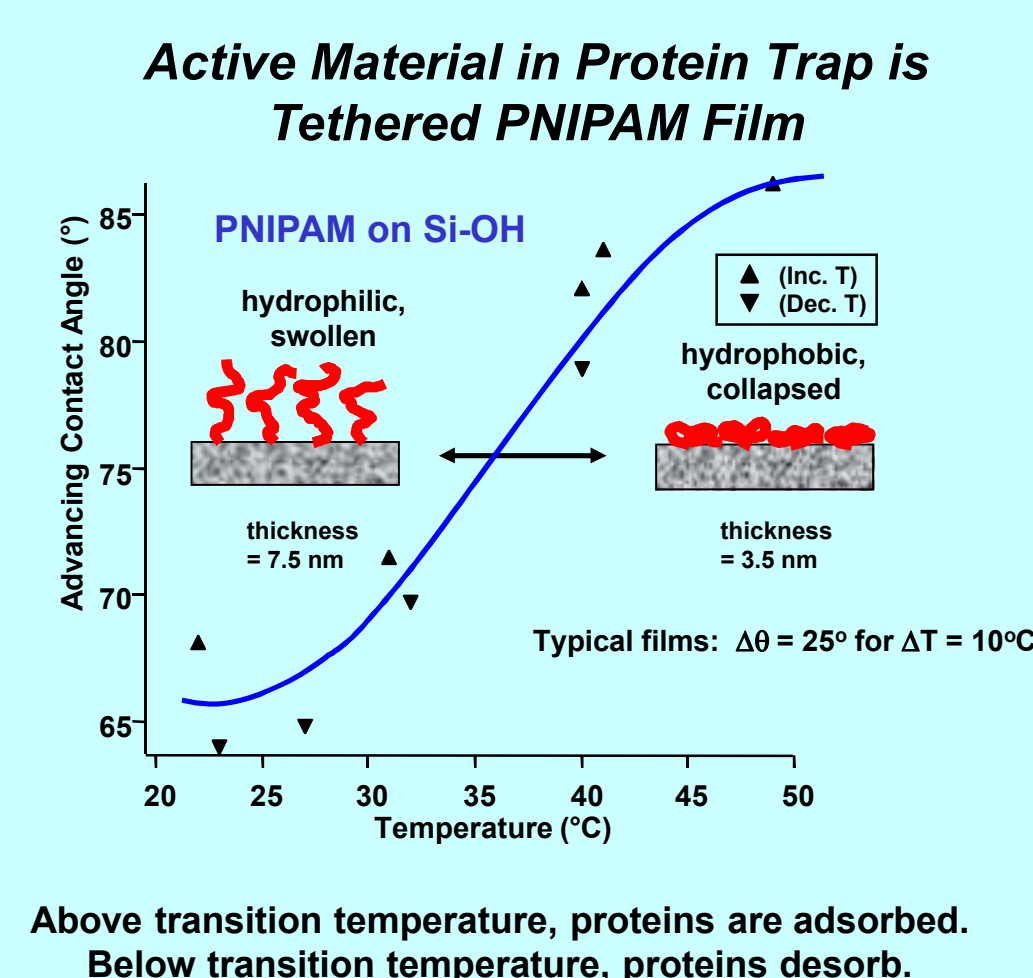


Goal: Use energy-consuming components to switch interfacial properties for the programmable assembly and reconfiguration of nanomaterials.

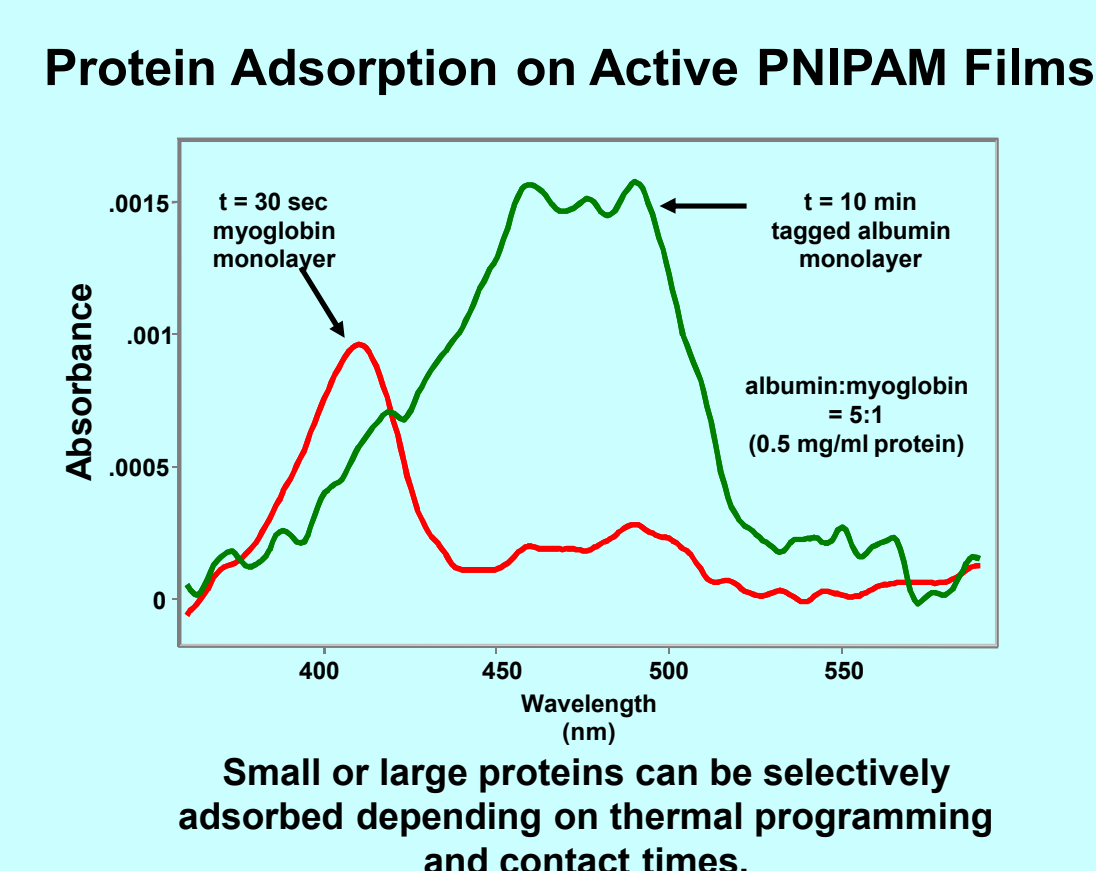
Thermal Stimulation

Active Components



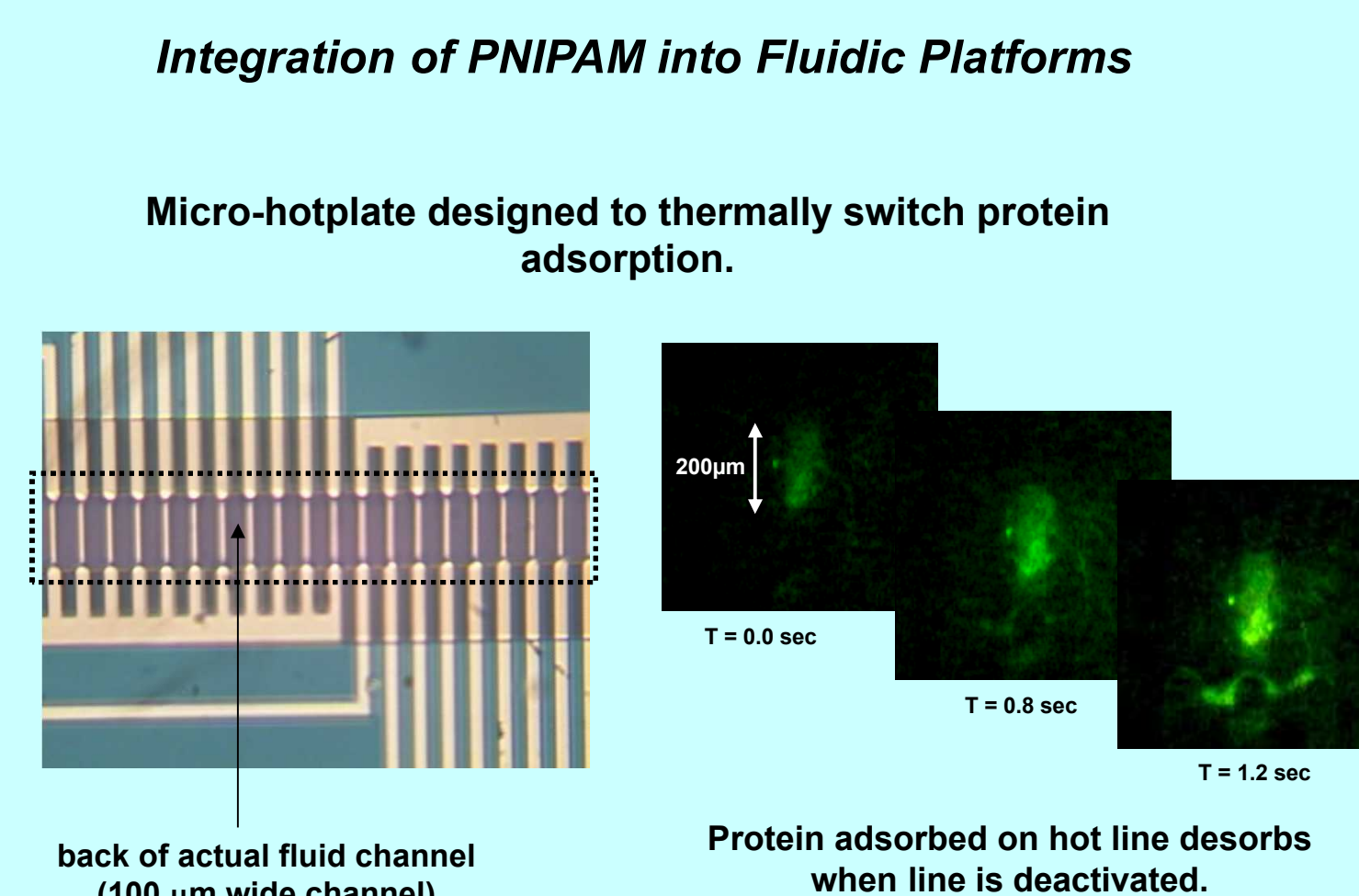
Dale Huber

Characterization Of Switching



Science, 301, 5631 (2003)

Material Responses

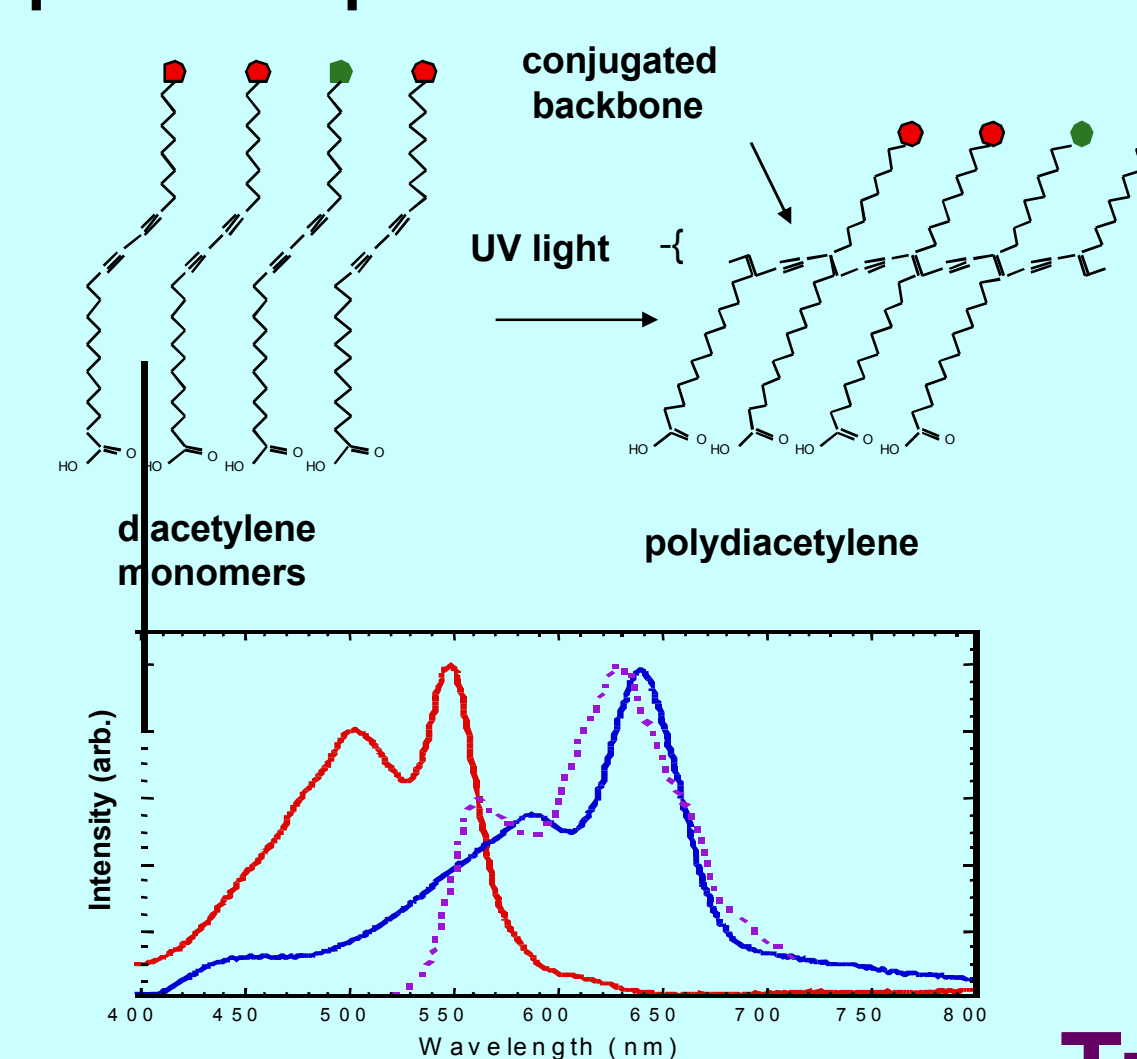


Ron Manginell

Mechanical Stimulation

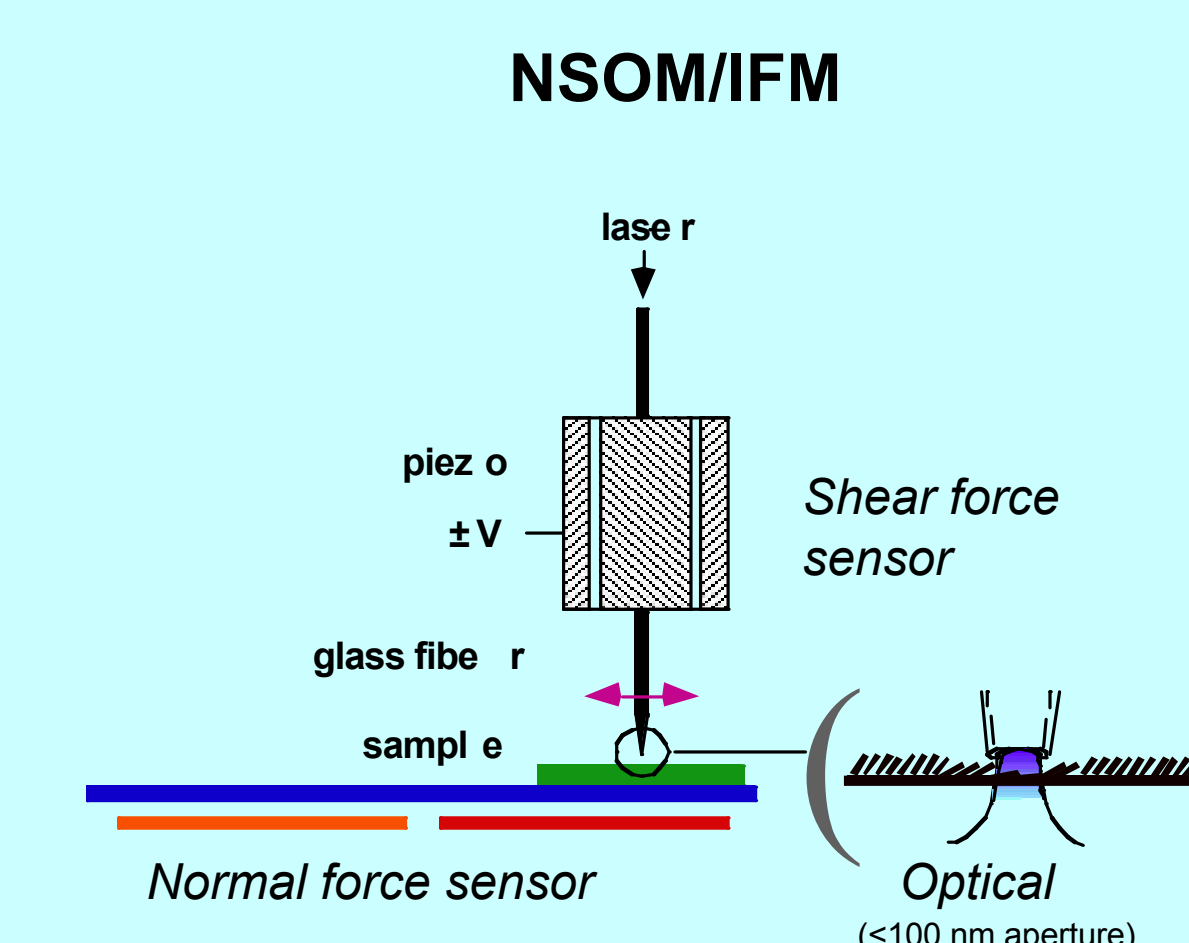
Active Components

Phase Transition In Polydiacetylene: Mechanical Stimulation Triggers Optical Response



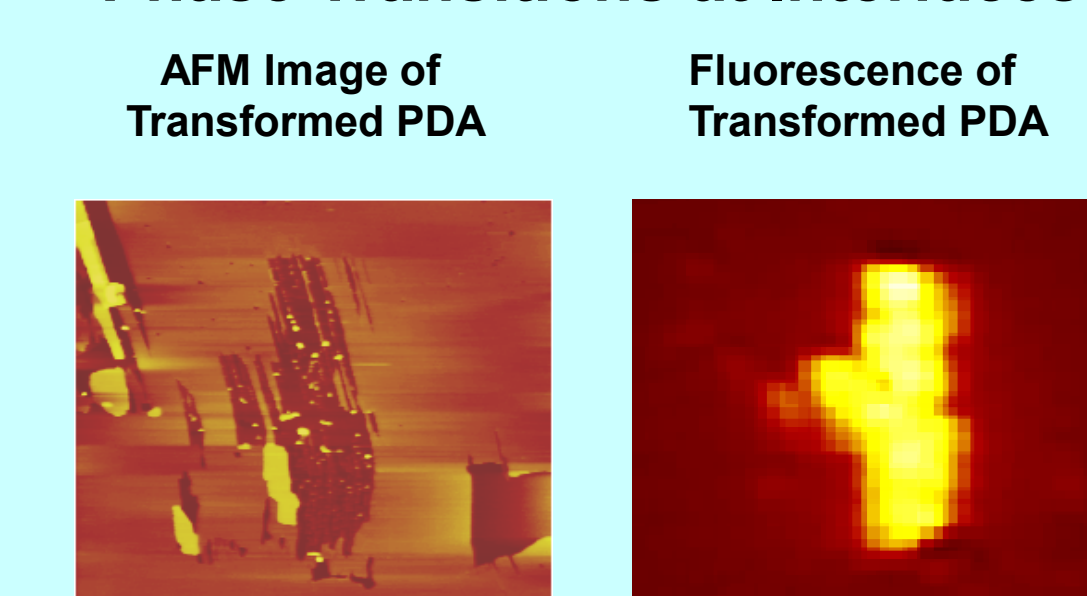
Tribology Lett., 10, 89 (2001)

Characterization Of Switching



Material Responses

Phase Transitions at Interfaces



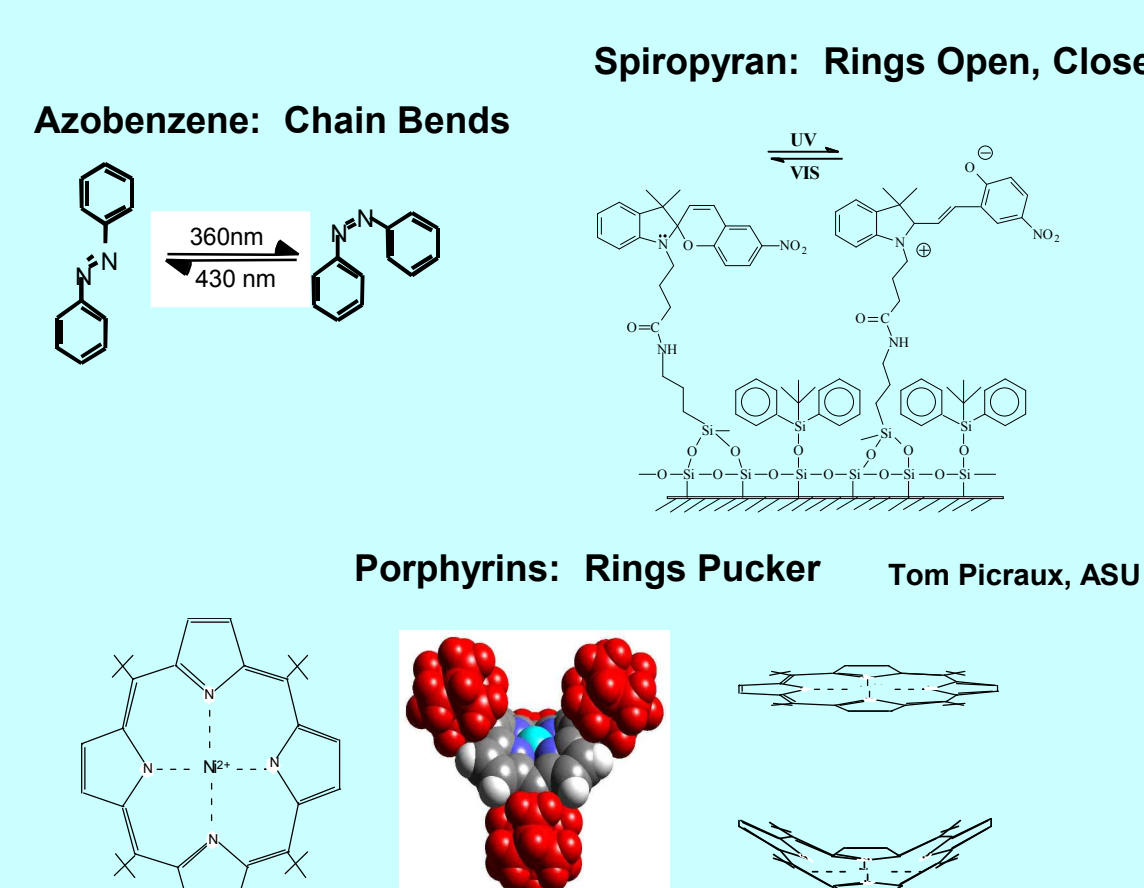
Local mechanical stimulation with IFM tip triggers blue-to-red transition. Tip motions perpendicular to central chain axis are most effective. Transition propagates along chains to provide response amplification. Hydrogen-bonding within side chains $\rightarrow$ done to make transition reversible.

Alan Burns

Optical Stimulation

Active Components

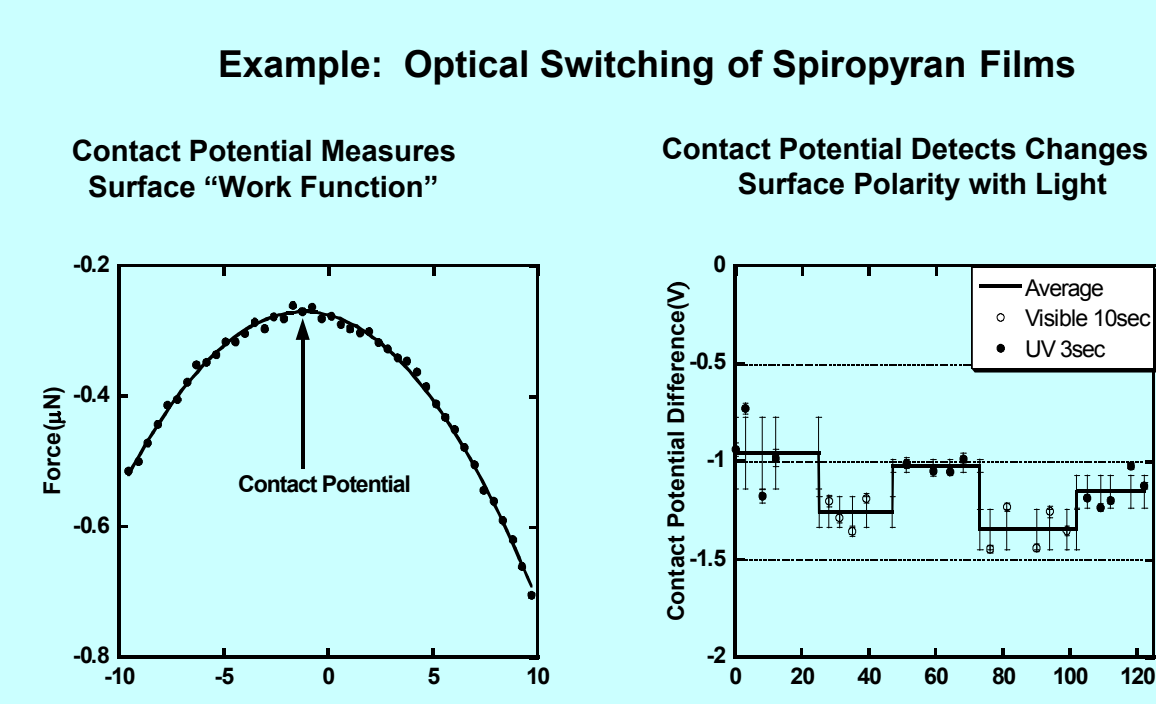
Conformation Changes Accompany Optical Stimulation



John Shelnutt

Characterization Of Switching

Contact Potential Measurements in IFM Detect Changes in Monolayer Polarity



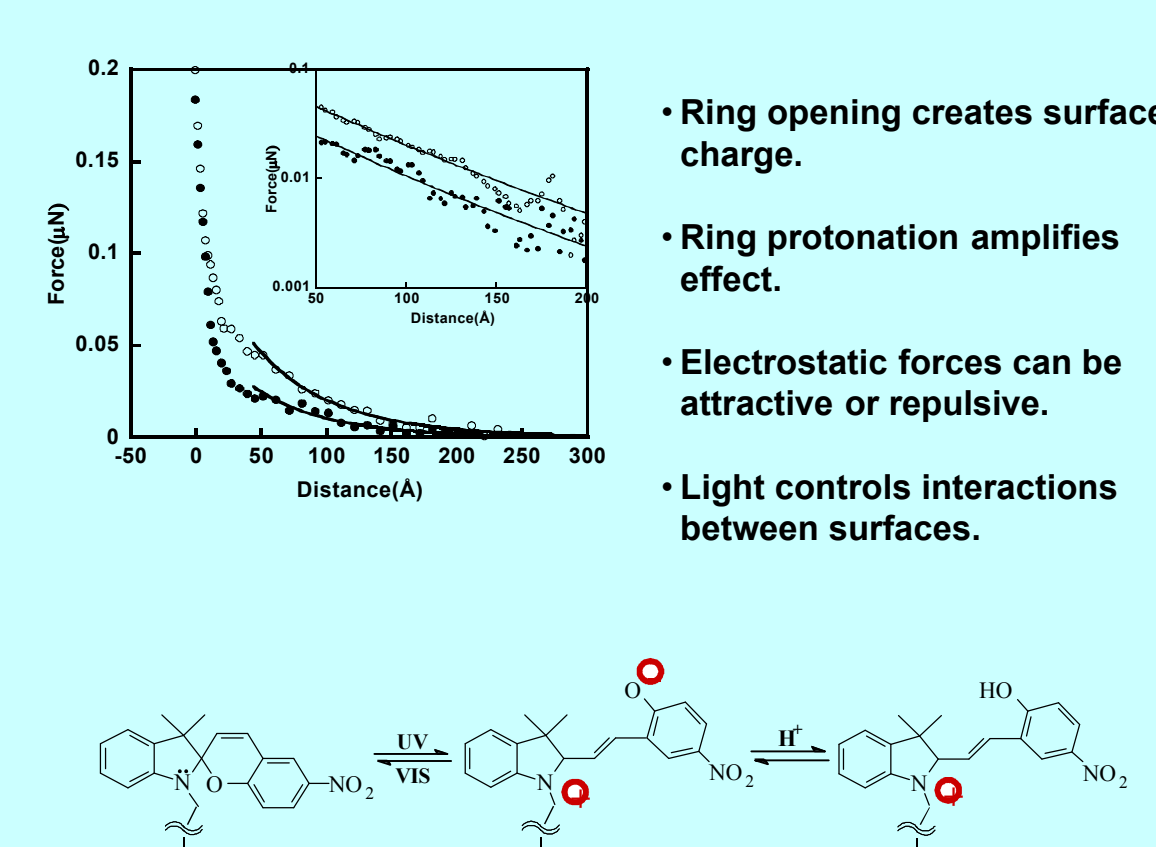
Ring opening creates more polar surface.
Ring closing creates less polar surface.
Optical switching is reversible.

Byung-II Kim

Nanoletters, 3, 1723 (2003)

Material Responses

Optical Switching of Spiropyran Films Controls Electrical Double Layer Forces

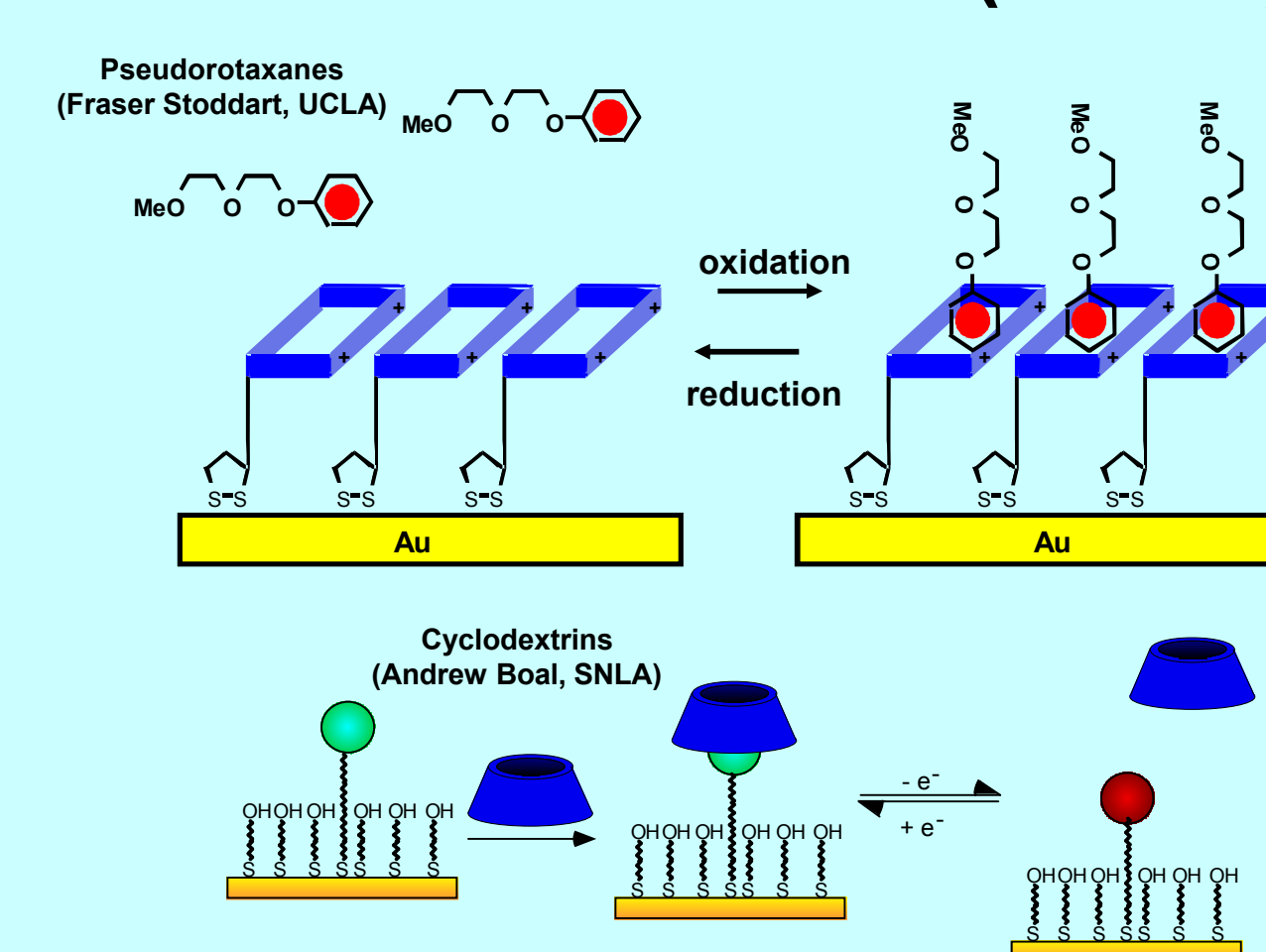


Tom Picraux

Electrochemical Stimulation

Active Components

Fraser Stoddart (UCLA)

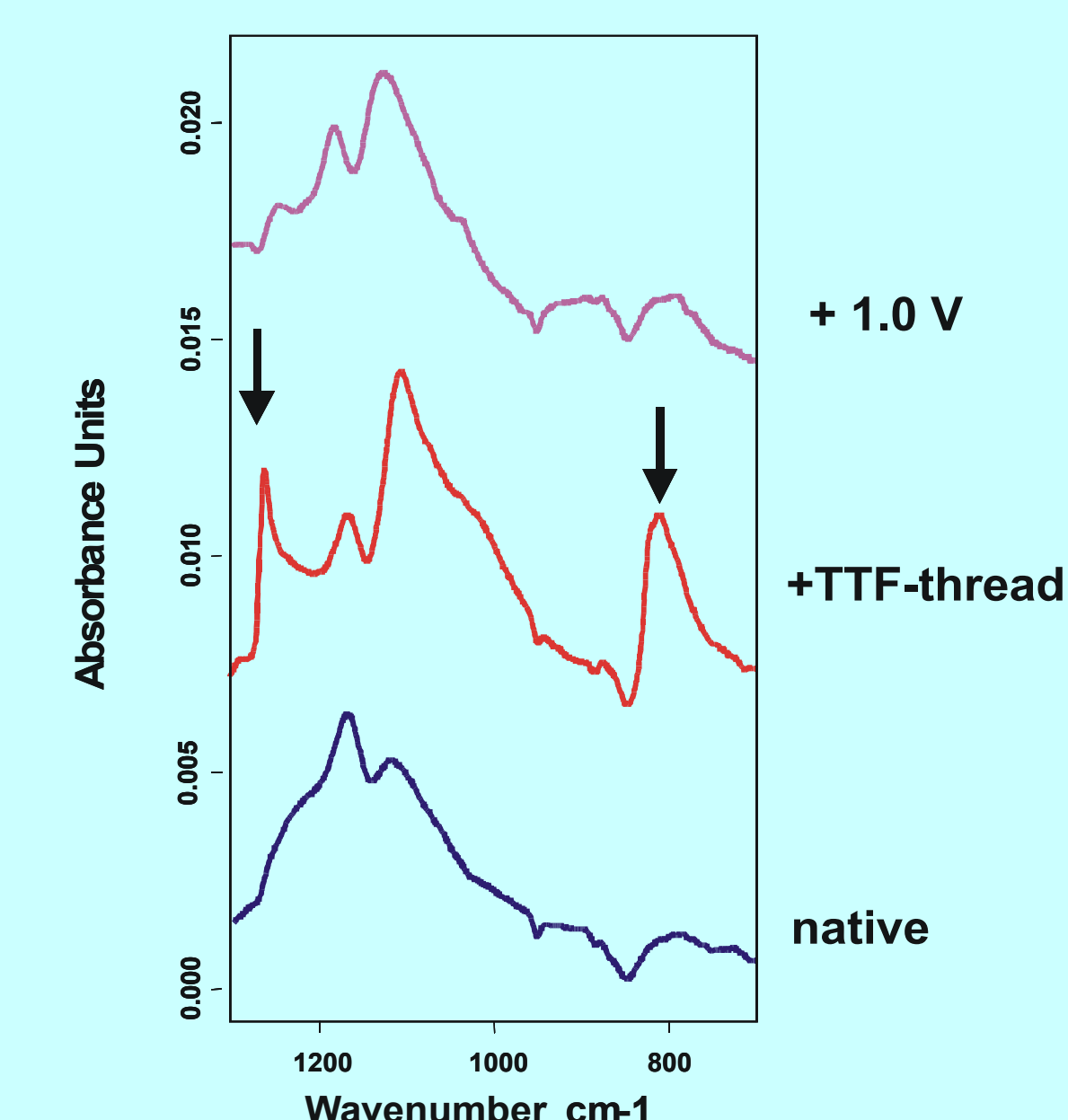


Andrew Boal, Matt Farrow

Accepted by Langmuir

Characterization Of Switching

Reflectance Infrared Spectroscopy Shows Reversible Threading



Material Responses

Molecular Machines Switch Contact Angles

