NANOHOUR

Wednesday, October 26th

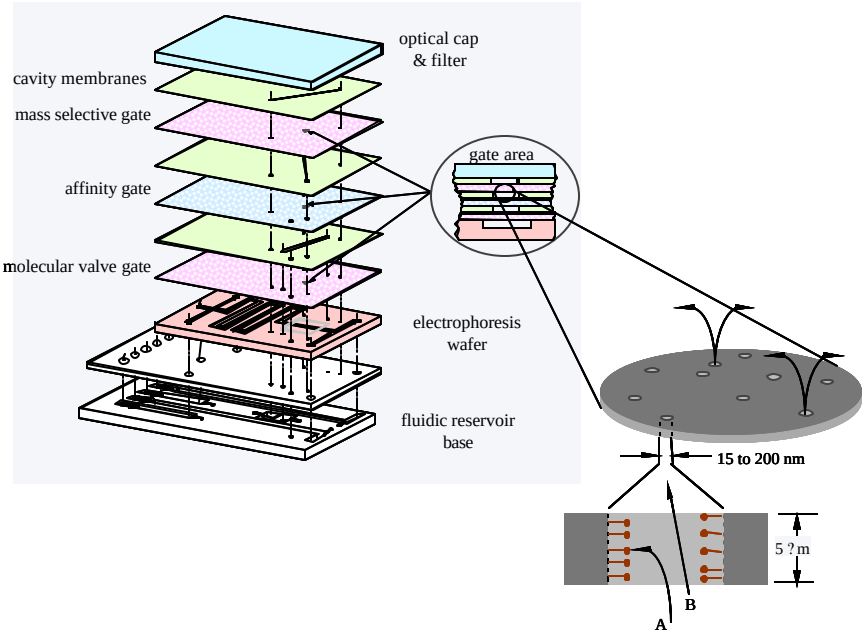
3:00 PM

Beckman Institute - Room 3269

The Role of Nanopore Size on Differential Ion Transport Across Nanocapillary Array

Dr. Enid Gatimu

Transport in nanopores is dependent on the nature of the electrical communication between the pores and the surrounding environment. In our devices, nanopores, in the form of nanocapillary array membranes, function as a gate between two microfluidic channels. The gate isolates the fluidic environments in the microchannels and when a voltage is applied, selectively allows ions and analytes to move between the channels. Experimentally it is observed that different ions move at different velocities which depend on the applied voltage and the size of the nanopores. By correlating conductivity measurements to measure the small transmembrane currents due to differential ion transport, with laser induced fluorescence spectroscopy to track bulk flow characteristics and computational modeling, insight is gained into the nature of the relative mobilities of the ions and their impact on the complex transport processes occurring at the nanoscale.

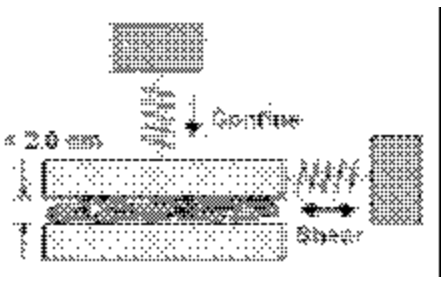


AND

Conjugated Polymers Confined and Sheared in Surface Forces Apparatus

Dr. Sung Chul Bae

A dilute solution of MEH-PPV, poly(2-methoxy-5-(2-ethylhexyloxy)-1,4-phenylenevinylene), was exposed to atomically smooth surfaces of muscovite mica and allowed to adsorb from toluene, and then the surface spacing was reduced to ~2 nm, which is less than the unperturbed radius of gyration of the polymer chains. Subsequent unidirectional shear with amplitude ~20 times the surface spacing provided preferential alignment while the solvent evaporated. Chain alignment was quantified from both photoluminescence and absorption spectra. Curiously, a bimodal distribution of chain alignment was observed, parallel to the shear direction in 2/3 of the cases but perpendicular to the shear direction in 1/3 of the cases.



Coffee and cookies will be served

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