

NANO HOUR

Wednesday, October 11, 2006

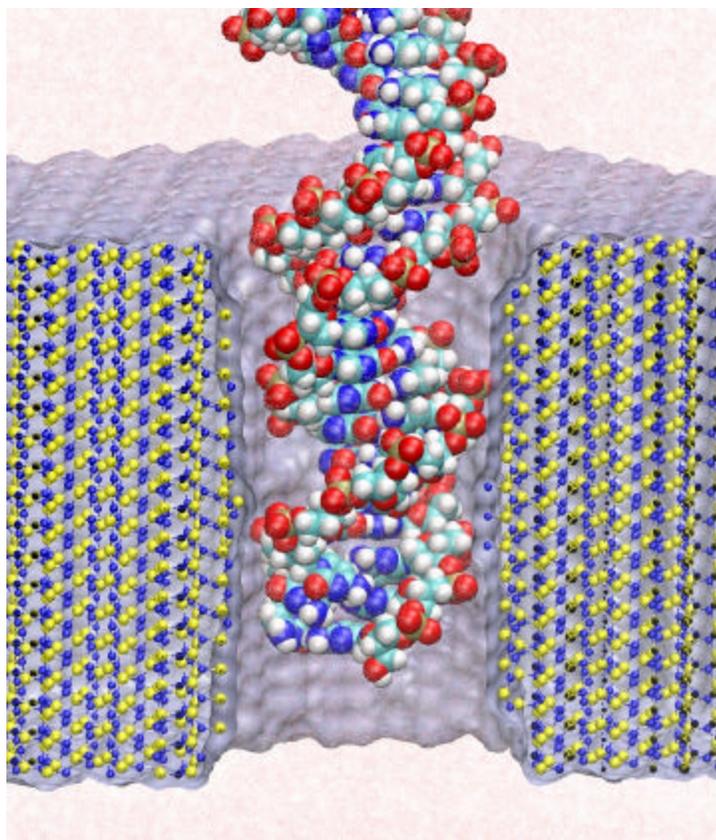
3:00 PM

Beckman Institute - Room 3269

Toward Sequencing DNA with a Synthetic Nanopore

Dr. Aleksei Aksimentiev – Assistant Professor in Physics

Knowledge of an individual's genetic makeup can lead to the prediction and treatment of many diseases by means of personal genomic medicine and pharmacogenomics. For the sequencing of a patient's genome to become a common medical routine, the development of an inexpensive, high-throughput genome sequencing technique is necessary. An interdisciplinary team at the University of Illinois is developing a fast and inexpensive method for sequencing DNA that would detect individual DNA bases



due to the differences in their dipole moments. In this method, single DNA molecules are forced to permeate through a nanometer-size pore in a capacitor membrane, producing electric signals that can be recorded. Large-scale molecular dynamics simulations are used to image the conformational dynamics of DNA in a nanopore, and to determine conditions optimal for deciphering the DNA sequences. In this talk I will summarize our recent progress toward developing such a nanopore sensor, and discuss possible strategies for sequencing DNA that emerged from our recent molecular dynamics and continuum electrostatics calculations.

Coffee and cookies will be served.

<http://nanohour.beckman.uiuc.edu>