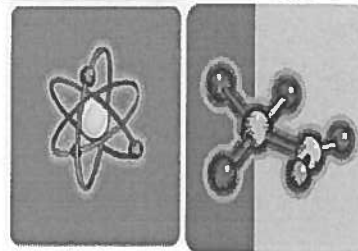




Department of Physics and Astronomy
202 Nicholson Hall
Louisiana State University and A&M College
Baton Rouge, Louisiana 70803-4001

WEEKLY CALENDAR

January 15, 2007



Tel: 225-578-2261/Fax: 225-578-5855
<http://www.phys.lsu.edu>

General Seminar

"The Sensitivity Limits of Nanowire Bio-Sensors"

3:40PM / Thursday, 18 January 2007 / Room 109

[Refreshments served at 3:15 PM in Room 229 Nicholson]

Host: Dr. Philip Adams

Xuan Gao, Ph.D.

Harvard University, Department of Chemistry and Chemical Biology

Nanowire field effect transistors (NWFETs) are emerging as powerful tools for biological applications such as bio-molecule detection, yet their sensitivity limits are not understood at a fundamental level. I will discuss the interplay of device parameters such as gate bias and NW diameter on the operating modality and sensitivity of NWFET sensors. pH and cancer marker detections are studied as silicon-NWFETs are tuned from linear to subthreshold regimes by electrochemical gating. First, pH sensing data show that NWFET has the strongest response and the best signal to noise ratio in the subthreshold regime. Operating in the subthreshold regime also reduces the detection limit for prostate specific antigen down to ~fM for a device with ~pM detection limit in the linear regime. This sensitivity improvement is due to the stronger gating effect of the molecule binding on NW surface. A quantitative model describing these results and the intrinsic charge detection limit of NWFET sensors will be discussed. I will also discuss future biophysics applications of such ultra-sensitive chem/bio-sensors.

Saturday Science

"TBA"

10:00 - 11:15 / Saturday, 20 January 2007 / Room 130 Nicholson Hall

Host: Ravi Rau

Stephania Cormier, Ph.D.

Biological Sciences, LSU

Reminder:

The University will be closed on Monday, January 15, 2007 in observance of Martin Luther King holiday. Classes begin Tuesday, January 16, 2007.

Publication:

"An integrated approach to physics seminars for students," J. F. DiTusa, Am. J. Phys. 74, 1045-1046 (2006).