



UNIVERSITY OF CENTRAL FLORIDA

NANO SCIENCE TECHNOLOGY CENTER
ADVANCED MATERIALS PROCESSING & ANALYSIS CENTER

GRADUATE RESEARCH SEMINAR SERIES

Friday
April 24, 2015

12:00 PM — 1:00 PM

Research Pavilion
NSTC
Conference Room 475

*Pizza and drinks
will be provided*

Photon-Electron Harvesting in Thin-Film Flexible Solar Cells

Javaneh Boroumand (12:00 PM - 12:30 PM)
Dr. Debashis Chanda's Group

Cost effective and high efficiency solar cells are important in order to reduce burden on fossil fuel based energy generation and minimize environmental pollution. Mono-crystalline silicon (c-Si) remained number one material of choice for harnessing solar energy due to natural abundance, superior electronic properties, chemical/radiation hardness, and low cost in manufacturing. These thin cells, 3-6 μm thick which are about 60-30 times thinner than present conventional c-Si cells, can efficiently absorb the incident solar spectrum due to the light trapping which enhances effective absorption length by tight confinement of light inside the thin wafer. Further study has been done on these structures' electrical properties. This work also shows device sensitivity as a function of doping profile, and surface passivation which leads us developing an optimized cell with the maximum conversion energy that can possibly be generated. These lightweight, flexible, highly efficient and low cost devices can surpass that of present conventional commercial silicon solar cells.



Liquid Crystal-Based Biosensors for Detection of Bile Acids

Sihui He (12:30 PM - 1:00 PM)
Dr. Jiyu Fang's Group

Liquid crystal has found wide applications in display and photonics, while its applications in biosensor are getting more attention recently. One unique property of liquid crystal is that liquid crystal is very sensitive to any change at its surface, hence it can be used as an optical magnifier to probe the target molecule at the liquid crystal surface. Compared with commercial detection methods such as chromatography and enzyme assay, liquid crystal-based biosensor is simple, portable, and inexpensive. This would be good for self-screen of suspected diseases. In this presentation, I'll show the design of liquid crystal-based biosensor for the detection of bile acids, which are biological surfactants and biomarkers for liver diseases.

