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Seminar

Materials Science & Engineering

Presents:

Dr. Yanke Che

**Post Doctoral Researcher, Materials Science and
Engineering and USTAR, University of Utah**

“One-dimensional Self-assembly of Organic Molecules: *Structure, Property and Function*”

The research mainly focuses on one-dimensional (1D) self-assembly of planar π -conjugated (semiconductor) molecules and the investigation of the 1D confined electric (charge carrier mobility) and optical (emission, exciton diffusion) properties of the nanowires or nanobelts thus formed. Combination of these unique optoelectronic properties enables development of the sensor systems for vapor analytes, including explosives and organic amines. Two types of building-block molecules have been employed to explore the 1D self-assembly and the application in optoelectronic sensing: one is perylene tetracarboxylic diimide (PTCDI, n-type) and the other is arylene ethynylene macrocycle (AEM, p-type). The next step of research along this trend will be portioned into two directions: one is the construction of a 1D nanostructure that possesses long-lived charge separation and effective migration of the separated charge carriers towards the electrodes for much improved photovoltaics. The other direction of research will be aimed at establishing a material model for accurate gauging of exciton diffusion length in organic crystals, which represents one of the critical problems to be solved for organic semiconductors. Also to be briefly covered in this talk will be the recent development of molecular probes and sensor systems for trace detection of metal ions, e.g., mercury and zinc, which are of particularly concern to environmental and health problems.

Wednesday September 2, 2009

4:10-5:00 p.m.

1230 WEB