



Colloquium Speaker

Thursday, March 6, 2008, 4 pm, CF 105

Refreshments 3:30 pm - Physics/Astron Conference Rm CF 386

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**Optoelectronic devices based on semiconducting polymer
homojunctions**

Junctions between p and n type inorganic semiconductor materials are the fundamental structure upon which nearly all semiconductor technology is based. The stabilization of such junctions formed *in situ* within a solution-processed semiconductor has great potential in the continuing expansion of organic materials in electronic and/or photonic devices. Here we describe a process by which such junctions can be formed in semiconducting polymers in which the distribution of counterions is fixed through the formation of covalent bonds. These fixed-junction devices demonstrate homojunctions that are stable in both forward and reverse bias, display high rectification ratios, and give rise to a significant photovoltaic effect. Because of the stability of the assembled fixed-junction under a range of operating conditions, this method shows promise beyond light-emitting displays for a range of homojunction-based device architectures for rectification, amplification, and photovoltaic applications.