

EE 298-12  
Solid State Technology and Devices Seminar

Friday, 4 April 2014  
1-2pm  
540A/B Cory Hall

## **Disorder Effects in the Electronic Properties of Organic Solar Cells**

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**PARC**

### *Abstract*

Organic solar cells self-assemble from a solution of a polymer and fullerene, forming nanoscale domains with a complex physical structure. These bulk heterojunction cells have increased rapidly in efficiency through the design of new polymers with optimized properties. The talk will discuss the mechanisms of charge creation, electronic conduction and recombination. Localized electronic states caused by structural disorder are important because they introduce band tails and deep traps in the electronic structure. Experiments show that these states play a central role in the conduction and recombination mechanisms. Defects induced by irradiation cause degradation of cell efficiency and are the result of light-induced dissociation of carbon-hydrogen bonds.

### *Bio*

Bob Street received a Ph.D. in physics from Cambridge University. He worked at Sheffield University and the Max Planck Institute in Stuttgart before joining the Palo Alto Research Center in California where he is now a Senior Research Fellow. His research has focused on large area electronics, including amorphous silicon, flat panel x-ray image sensors and more recently, printed organic semiconductors, flexible electronics and organic solar cells.