

# SCV Components, Packaging and Manufacturing Technology + Women in Engineering

## WEDNESDAY September 10, 2008

### Novel Approaches to Low-Cost Solar Cells: Science and Challenges

**Speaker:** Prof. Peter Peumans, Dept. of Electrical Engineering, Stanford Univ, and Deputy Director of the Center for Advanced Molecular Photovoltaics (CAMP)

**Time:** Dinner (optional) at 6:30 PM, Presentation at 7:30 PM

**Cost:** \$25 if reserved by Sept. 8; \$30 after & at door; no cost for presentation

**Place:** Ramada Inn, 1217 Wildwood Ave (Fwy 101 frontage road at Lawrence Expressway), Sunnyvale

**RSVP:** by email to Janis Karklins, [karklins@ieee.org](mailto:karklins@ieee.org)

**Web:** [www.cpmt.org/scv/cpmt0809.html](http://www.cpmt.org/scv/cpmt0809.html)

In this talk, I will discuss various approaches to harvesting solar energy that promise to lower the cost of solar electrical power. I will describe an approach that combines monocrystalline silicon with MEMS processing and advanced packaging to make low-cost, high-efficiency silicon solar cells. I will show that organic solar cells are an attractive way to convert sunlight into electrical power since the materials are low-cost, abundant and non-toxic. The efficiency of organic solar cells has increased steadily in recent years by virtue of engineered organic nanostructures that optimize exciton and carrier transport. I will discuss how metal conductors can be made extraordinarily transparent and solution-processable such that they can be used as transparent electrodes in thin-film solar cells. Finally, I will discuss the fundamental limits of light trapping in thin-film solar cells and show how photonic nanostructures can be used to improve solar cell efficiency.

Peter Peumans is an Assistant Professor of Electrical Engineering at Stanford and Deputy Director of the Center for Advanced Molecular Photovoltaics (CAMP). He is an expert in solar cell modeling and characterization. He has developed several efficient organic solar cell device architectures and has contributed to today's understanding of the mechanisms that play a role in organic solar cells. Peumans also contributed to the development of vapor phase deposition techniques that lend themselves to reel-to-reel processing of organic and organic/inorganic nanocomposite solar cells. Two of Dr. Peumans' publications are in the top-20 cited papers in the field of solar cells. He holds 10 patents and has 5 or more pending. He is a co-founder and the Chief Scientific Advisor of NetCrystal, a Silicon Valley startup focusing on low-cost microconcentrator solar cells using a technology developed by Peumans' group at Stanford. Dr. Peumans is on the advisory board of Solexel. Prof. Peumans is the recipient of an NSF CAREER award.

