



Templated Nanoparticle Dye-Sensitized Solar Cells

Wednesday, February 14, 2007
Babbio 221, 3:00 pm

***** NOTE: ROOM AND TIME CHANGE *****

Professor Dunbar P. Birnie, III
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“Nanotechnology” is often given credit for being able to revolutionize a wide variety of high-tech fields, and photovoltaic energy collection is no different. This presentation will start with a broad view of photovoltaic energy collection and examine ways that nanotechnology may influence the overall efficiency of energy capture for a variety of different device architectures. This will lead to an overview of some of the coating and nanoparticle studies that we are currently conducting and our hopes for improving the solar cell efficiency and processing reliability – especially as related to future printable and flexible electronics. Our recent research has focused on dye-sensitized solar cells (DSSC’s) that incorporate nanoparticle titanium dioxide coatings as one component of the cells. Among other things, we are currently looking at templated titanium dioxide and the use of anisotropic shaped particles to overcome some possible limitations to the collection efficiency.

Professor Dunbar P. Birnie, III is the Corning/Saint-Gobain/Malcolm G. McLaren Professor of Ceramic Engineering in the Department of Materials Science and Engineering at Rutgers University. He came to Rutgers in 2004 after spending 17 years in the MSE department at the University of Arizona. He earned his BS and PhD from MIT, both in MSE, in '81 and '86, respectively. His research areas include sol-gel coatings and reliability issues when making coatings. Applications he has worked on include ferroelectric coatings for non-volatile memory, optical waveguides, and interference filter stacks. Prof. Birnie’s research group is presently working extensively on coatings for solar applications – including complex, self-assembled, heterojunction, and multijunction solar cell architectures. More information regarding Prof. Birnie’s research can be found on the following websites: general homepage can be found at <http://www.rci.rutgers.edu/~dbirnie>; more information on coating-quality can be found at <http://www.coatings.rutgers.edu>; and a cursory index of Rutgers Solar Efforts can found at <http://www.solar.rutgers.edu>.

Light refreshments will be served prior to seminar

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