

Abstract Submitted  
for the TSF10 Meeting of  
The American Physical Society

**Capturing the Potential of Dye-Sensitized Solar Cells** JAMES BENSON, University of Texas at San Antonio — Dye-sensitized solar cells are a continually developing type of low-cost solar cells that have commercial efficiency around 6-10%. The proposed research here will be focusing on the photo-bleaching and improving techniques for electron transport. Nature has given us a goal to reach towards with proven techniques for converting light into energy with around 30-40% efficiency, however, chlorophyll, the light absorber in plants, is expensive and it is not practical to make solar cells with only chlorophyll as the absorber. One such alternative to chlorophyll is phthalocyanines which is a common industrial dye used in many applications. This dye has a common similar ring without the long phytol chain that chlorophyll has. Previous research has shown that encapsulating organic dyes can magnify the properties of dye from the increased concentration with a possible benefit of stabilizing the dye allowing it to slow down the photo bleaching significantly. Likewise, such encapsulation may help with thermal stability since many dye-sensitized solar cells require a liquid or gel solution that is sensitive to thermal expansion. Many researchers are also finding new ways to encapsulate the dyes or dope the p-n layers with nano and meso tubes to help with electron transport or build the p-n layers right in the tubes. This allows for countless layers and an overall more efficient design.

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Date submitted: 08 Oct 2010

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