

Thin Film Solar Cells: Enhancing Efficiency using Various Nanoparticles

We present herein the work started at SUNY Oswego as a part of a SUNY SCAC grant. The SUNY SCAC Committee has awarded Dr. Carolina Ilie and Martin Dann a grant to carry out extensive studies on thin film solar cells. The focus of the study is to develop miniaturized solar cells using rare earth free metals, yet have at least the same efficiency as the industry standard. The Langmuir Blodgett method of thin film deposition will be used to create a nanoparticle monolayer on the surface of water, and then be deposited onto a silicon wafer. Repetition of this process will lead to the creation of the thin film, which consists of many monolayers stacked on one another. Martin Dann has started the preliminary work for the project and will continue the project. The preliminary work concentrates on analyzing the properties of magnetic nanoparticle candidates, band gap, and the fabrication of thin films. The continuation of this work will include the fabrication of more samples, as well as performing IV curve tests on the samples. These tests will determine how much power is put out from the solar cell given a known power input, giving the efficiency of the cell.

Keywords: Nanoparticles, thin films, solar cells, Langmuir Blodgett Method