Novel Fabrication of Thin Film Luminescent Solar Concentrators

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Energy is a necessity for civilization. This project focused on a vision to expand and redefine what energy infrastructure is. The design criteria of sustainability, renewability, and accessibility were fundamental in developing a new solution and molded the research, design, and fabrication processes. Luminescent solar concentrators (LSC) is the chosen technology. LSCs take light energy from a wide area and concentrate it to a specific point where a solar cell turns the redistributed light into electricity. The light energy is concentrated in an LSC using UV-reactive dyes. All LSC prototypes were made from scratch and tested for current and voltage. The LSCs were optimized using concentration stages of dye concentrations, and compared against their derived current (I) voltage (V) curve. The final LSC design took the optimized material specifications and implemented the data into a new 5 layer composite design (C5). The data collected supports the drive for implementation of the new C5 design in LSCs. The design of the C5 LSCs is unlike any other and also provides a better modular design for customization and further upgrades. This project redefines where energy can be sourced. From the screens of smartphones to the windows on skyscrapers, the new C5 LSC design is the next generation of sustainable, renewable, and accessible energy infrastructure.

Awards Won:

Second Award of $2,000