

MICRO-OPTICAL TANDEM LUMINESCENT SOLAR CONCENTRATOR

Tech ID: 29137 / UC Case 2018-065-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,227,964	01/18/2022	2018-065

BRIEF DESCRIPTION

Silicon photovoltaic (“Si-PV”) modules currently dominate the solar energy market. Increased progress into Si-PV efficiency enhancements combined with historically low module costs aim to decrease the overall Levelized Cost of Electricity (“LCOE”) to a point competitive with non-renewable energy sources. Despite recent LCOE reductions, Si-PV technology remains economically inferior to fossil fuels. Additionally, flat-plate Si solar modules generally require geographical locations with high direct normal incidence (“DNI”) sunlight conditions in order to maintain module performance. Both the strict DNI requirement and the high LCOE of Si-PV cells ultimately limit the dissemination of solar power into the global energy market. A solution for the capturing of diffuse sunlight includes the use of optical concentrators. One class of optical concentrators includes luminescent solar concentrators (“LSCs”). Luminescent solar concentrators have garnered interest due to their ability to utilize diffuse light and their potential for use in architectural applications such as large area power-generating windows. However, LSCs have not yet reached commercialization for photovoltaic power generation, largely due to their comparatively low power conversion efficiencies (“PCEs”) and lack of scalability.

Researchers at UC Berkeley and other educational institutions have developed luminescent solar concentrators that can be designed to minimize photon thermalization losses and incomplete light trapping using various novel components and techniques.

SUGGESTED USES

» Silicon photovoltaics

ADVANTAGES

» Minimize photon thermalization losses and incomplete light trapping

CONTACT

Terri Sale
terri.sale@berkeley.edu
 tel: 510-643-4219.



INVENTORS

» Alivisatos, Armand P.

OTHER INFORMATION

CATEGORIZED AS

» **Optics and Photonics**

» All Optics and Photonics

» **Energy**

» Solar

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