Area 3: III-V Compound Semiconductor and Concentrator and Space PV Technologies.

LUMINESCENT SOLAR CONCENTRATOR DESIGNS

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This abstract shows the results of a design study on possible applications for Luminescent Solar Concentrator (LSC) PV technologies. The study focused on product integration of LSC PV technologies and was executed by students of Industrial Design Engineering at University of Twente (NL) in 2016. In total 16 different and highly innovative conceptual designs resulted from this project, which were prototyped at scale to show their feasibility and integration features.

The presentation will show several concepts to be discussed regarding relevant findings for the integration of LSC PV technologies in future products and buildings. It is shown that the typical material properties of LSCs; low cost, colorful, bendable, and transparent do not only offer a lot of design freedom, but also offer excellent possibilities to incorporate this technology into the overall function and experience of applications.

Adding to this the presentation will focus on the development of a new LSC PV module using metal wrap though silicon solar cells. The presentation will show ray-tracing simulations and features such as efficiency, and concentration factor of this new module as well as the prototype of this LSC PV module in the context of luminescent solar concentrator design.

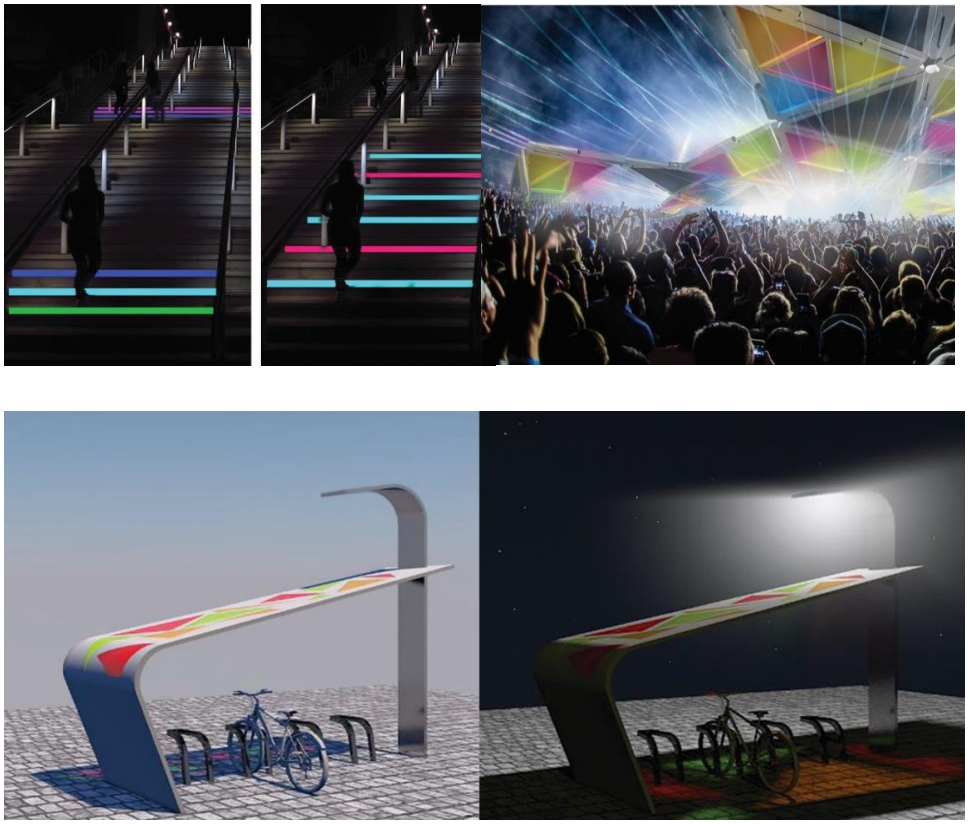

Figure 1: Examples of product designs with luminescent solar concentrator technologies
Left upper corner: interactive use of the LSC safety strips applied to staircases, right top corner: impression of festival tent with LSC panels in its roof, below: bike parking with LSCs