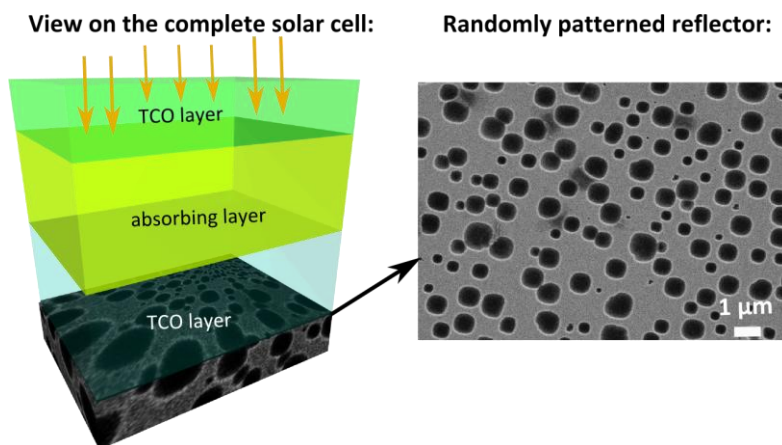


Diplom- | Master- | Studien- | Bachelorarbeit

Disordered nanostructures for absorption enhancement in thin-film solar cells



Motivation

Reducing the thickness of the absorbing layer in solar cells leads to significant cost reductions but induces severe optical losses. In order to increase the absorption, adapted periodical nanostructures such as diffraction gratings or photonic crystals were already implemented with success. Recent investigations have suggested that introducing a controlled amount of disorder in such configurations could further enhance the absorption of thin-film solar cells. In this context, our goal is to test the potential of patterned solar cells whose back reflector is corrugated with randomly distributed nano-holes (see *Figure above*).

Task

In the frame of this work, nano-patterned substrates will be fabricated using lithographic and dry etching methods and characterized (SEM, AFM, reflection measurements etc.) in order to control the amount of disorder introduced and their optical response. The resulting solar cells deposited on those substrates (not included in this Master work) will then be tested both optically and electrically in order to determine the gain in efficiency with respect to an unpatterned reference cell.

Prerequisites

We are looking for a motivated and meticulous candidate with a self-dependent working style. Any experience in the field of photovoltaics or in the fabrication and characterization of nanostructures would be an asset.

Research areas

Photovoltaics,
nanophotonics

Location

Light Technology Institute
KIT, Campus South

Focus

Technological development
and characterization

Educational background

Physics, Optics & Photonics
or Materials Science

Entry date

As soon as possible

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