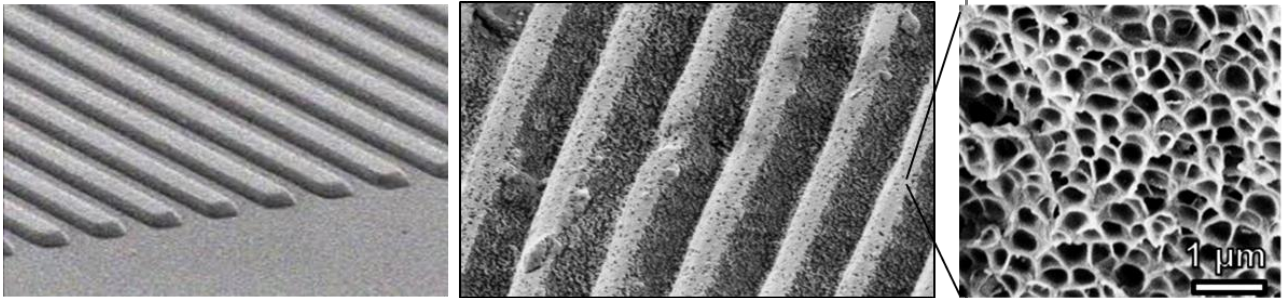


## Bachelor- / Masterarbeit

### Porous diffraction gratings with tunable optical properties



#### Motivation

Studying the interplay between coherent and incoherent optical effects has both fundamental and applied interest, in particular for achieving controllable optical properties that are not limited to a narrow spectral or angular range. This can be realized by adding a controlled amount of scattering in diffractive structures. Such optical elements can be directly exploited in Green photonics for improving light management in solar cells and light emitting diodes.

#### Objectives

The candidate will first develop polymer-based diffraction gratings via molding techniques (E.g. hot embossing). Volume scattering originating from air-filled microcavities will then be incorporated using saturation in supercritical CO<sub>2</sub>. The process parameters and therefore the size distribution and density of the microcavities will be adjusted to control the level of scattering introduced. The morphology and optical properties of the resulting diffraction gratings will be characterized (scanning-electron and atomic-force microscopy, spectroscopy) and analyzed with respect to reference gratings without volume scattering.

Depending on the advance and duration of the project, additional optical simulation package and testing possibilities on solar cells/ light emitting diodes can be offered.

#### Prerequisites

We are looking for candidates with a keen interest in optics and experimental work. A self-dependent working style and sharp analytical skills will be essential.

#### Research areas

Photonics  
Functional materials

#### Places

LTI (KIT, Campus South)  
IMT (KIT, Campus North)

#### Focus

Experiment & optical  
characterization

#### Entry date

**As soon as possible  
(starting August 2016)**

#### Contacts

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