Cooperation of Group “Novel Solar Cell Concepts” (Fraunhofer ISE) and Prof. Stefan Glunz (INATECH)

We are searching for a student joining our group during summer semester 2018 for a

Master/ Bachelor thesis on the topic:

**Synthesis and Characterization of High Band Gap Perovskite Absorbers for Perovskite Silicon Tandem Cells**

In less than ten years since the discovery of perovskite solar cells their efficiency has reached up to 22%. The most prominent perovskite absorber is methylammonium lead iodide (CH$_3$NH$_3$PbI$_3$); however, by varying the precursors a large number of perovskite absorber with the structure ABX$_3$ (CaTiO$_3$ type) with different optical and electrical properties can be synthesized. These perovskite thin films are usually deposited from solution (spin coating) or by vacuum evaporation.

In tandem solar cells two cells with different band gap are stacked on top of each other. Thus, spectral losses can be reduced and significantly higher efficiencies reached. The combination of efficient silicon solar cells with novel perovskite solar cells is an emerging field in photovoltaic research towards cost-effective tandem solar cells.

The aim of this work is to optimize the thin film deposition of crystalline perovskite absorbers with adjusted band gap for perovskite silicon tandem cells. Based on already established processes, the absorber layers then will be also integrated into complete solar cell devices. The work will be carried out at the Fraunhofer ISE and directly supervised by a PhD student.

Processing and characterizing thin films and solar cells provide an exciting insight into applied research on novel solar cell concepts, requires high motivation, interest in experimental work, as well as a responsible and precise way of working.

**Your tasks:**
- Thin film deposition of suitable perovskite absorbers in inert atmosphere (glovebox)
- Characterization of structural and optical material properties of single layers (GIXRD, UV-Vis spectroscopy)
- Implementation of absorber layers in solar cell devices for evaluation of optical and electrical properties as well as the potential to increase the power conversion efficiency (photoluminescence spectroscopy, current-voltage characteristics)

**Your qualification:**
- Experience and knowledge in the field of inorganic chemistry, characterization, semiconductors, handling of hazardous chemicals
- Science (chemistry, material science preferred) or engineering student

Please address your application and further questions to: patricia.schulze@ise.fraunhofer.de
Patricia Schulze M.Sc., phone: +49 (0)761 45 88-59 55