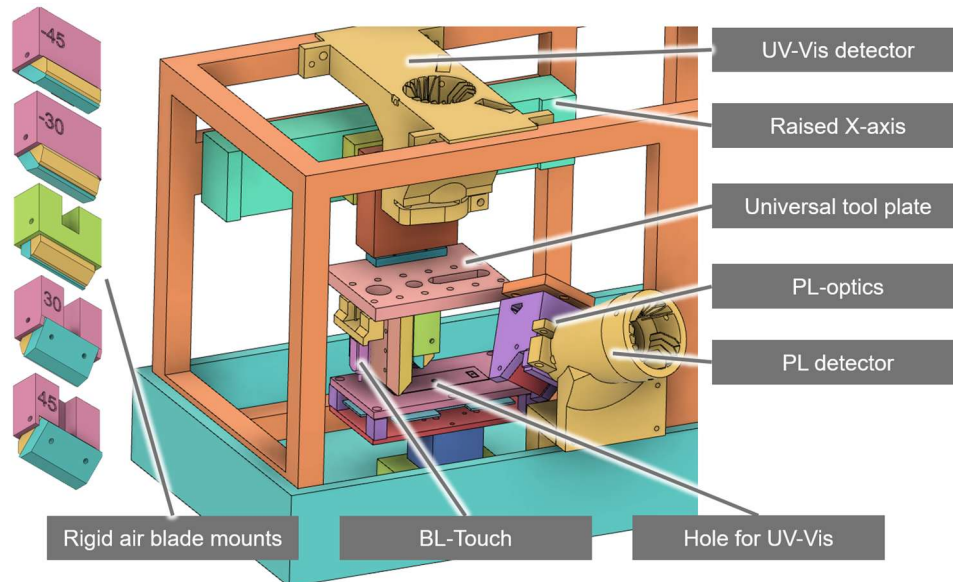


Doktorarbeit / PhD thesis

Laser annealing of hybrid metal halide perovskite thin films



At the Chair for Functional Materials at the Technical University of Munich, we investigate the physical basis of material properties using state-of-the-art scattering methods (neutron, X-ray, and light scattering) and spectroscopic techniques. The general goal of our research is to infer functional properties from knowledge of microscopic structure and dynamics.

We are looking for a PhD student to work on the project "In situ and operando probing of soft materials at buried solar cell interfaces". The salary is 1/2 TVL E13 for 3 years.

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Topic: Hybrid halide perovskite thin films have attracted a lot of interest in the scientific community over the past years as they exhibit outstanding optoelectronic properties that are on a par with conventional semiconductor materials. The perovskite thin film manufacturing process typically involves a solution coating step followed by a thermal annealing procedure for improving the thin film quality by inducing Ostwald ripening. Laser annealing in thin films involves fast phase transitions from an amorphous-crystalline phase to a highly crystalline phase as the laser scans through the thin film. Hybrid metal halide perovskite thin films exhibit a higher crystallinity within a shorter processing time upon laser-annealing compared to thermally annealed ones. The aim of this project is to observe these fast, laser-induced phase transitions that lead to an improved thin film quality and crystallinity via a multimodal approach combining advanced scattering methods and spectroscopy to reveal the mechanistic insights of such transitions on printed metal halide perovskite thin films. For this purpose, a slot-die coater was developed and will be upgraded to allow for laser annealing after slot-die coating.

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