



Bachelor or master thesis:

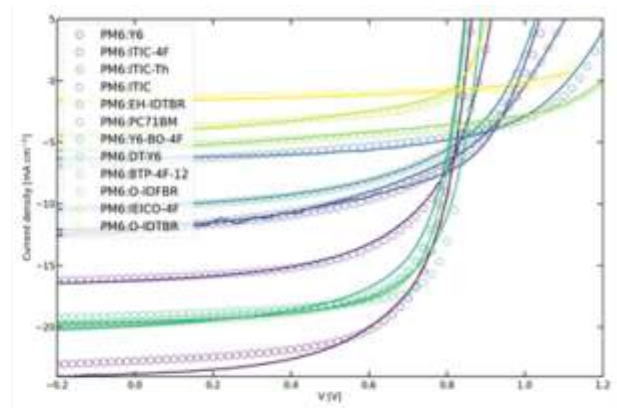
Simulation and Machine Learning Methods for Next Generation Solar Cells

At HI-ERN, we have developed an automated setup for the fabrication and characterization of printable solar cells such as organic photovoltaics and perovskites. This high-throughput approach allows us to test a large number of material combinations in a short time. One component of this approach is the simulation of the IV characteristics with the aim to extract the most important parameters for a certain material or for certain processing conditions.

We have recently developed an algorithm to fit IV curves simultaneously with measurement data obtained with other techniques, for instance transient absorption spectroscopy. The aim of this thesis is to apply the algorithm to different methods and compare how well the device parameters can be extracted. Optimizing the algorithm itself can be a task for students with a background in computer science.



Automated solar cell fabrication



Fit results of IV curves from different materials

We are looking for a student with an interest in programming and the application of numerical methods as well as the working principles of solar cells. Previous knowledge of Matlab and/or Python is beneficial. You will gain experience in the application of current machine learning methods, deepen your understanding of device physics, and additionally receive insight into the fabrication and characterization of organic solar cells. The thesis can be written in German or English.

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