

Master thesis

The chair of materials for electronics and energy technology (WW6, i-MEET) is offering the following master thesis topic to interested students:

Interface engineering in upscaling of flexible perovskite solar modules enabled by self-assembly monolayers

Details:

Perovskite solar cells have emerged as a promising next-generation photovoltaic technology, attracting increasing attention from universities, research institutes, and industry. However, the transition from lab-scale fabrication to industrial production remains a significant challenge. In particular, both the active layer and functional layers face substantial hurdles during large-scale upscaling.

Bridging the gap between small-area cells and large-area modules is crucial for commercialization. In this regard, self-assembled monolayers (SAMs) offer a promising solution due to their simple, rapid, and scalable deposition process, which plays a vital role in improving interfacial properties and carrier transport.

A deeper understanding of the microscopic and electrodynamic effects of SAMs on perovskite crystallization and film formation is essential to uncover their working mechanisms and quantify their impact on minimizing efficiency losses. This knowledge will provide valuable insights for optimizing large-area perovskite solar modules and accelerating their path toward commercialization.

The work will be conducted at energy campus Nürnberg (solar factory of the future) in the production of emerging PV group led by Michael Wagner.

Application via email starting from 01.03.2025.

Contact: Michael Wager

Solar factory of the future

Energy campus Nürnberg

Fürther Str. 250, 90429 Nürnberg

Email: mic.wagner@fz-juelich.de