

Master- and Bachelor Theses in Development of OPV Cells with High Throughput Methods

The Helmholtz Institute Erlangen-Nuremberg for Renewable Energies (HI ERN), part of the Forschungszentrum Jülich, researches and develops material- and process-based solutions for climate-neutral, sustainable and cost-effective utilization of renewable energies. In the OPV group we are using an automated high-throughput device fabrication line to optimize and investigate organic solar cells. Furthermore, we are using machine-learning to analyze the data and optimizing devices in a closed-loop approach.

Our group specializes in:

- Combinatorial materials research
- High-throughput film deposition and characterization
- Machine learning and closed-loop optimization
- Stability investigation

for the development of organic solar cells.

We offer the opportunity for **Master and Bachelor** theses in Organic Photovoltaic cell **manufacturing, characterization and optimization, and Machine Learning**

Qualification:

- Student of Material Science, Nanotechnology, Energy Technology , Physics or comparable require an examiner from their department.
- Keen interest in material development, in robotics and machine learning
- Self-driven and reliable
- Knowledge in data analysis (Python knowledge desirable)

Note: Students of MTW, NT, Energy Technology, MAP can be directly examined. Students from other disciplines require an examiner from their department

Publications:

Osterrieder et al., Autonomous optimization of an organic solar cell in a 4-dimensional parameter space, EES (2023), <https://doi.org/10.1039/D3EE02027D>
 Du et al., Elucidating the Full Potential of OPV Materials Utilizing a High-Throughput Robot-Based Platform and Machine Learning, *Joule* (2020) <https://doi.org/10.1016/j.joule.2020.12.013>
 Wagner, J. et al. The evolution of Materials Acceleration Platforms - towards the laboratory of the future with AMANDA (2021) [arXiv:2104.07455](https://arxiv.org/abs/2104.07455)



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