

Master- and Bachelor Theses in Accelerated Characterization of Organic Semiconductors for OPV Applications

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.

The research group High Throughput Materials and Devices specializes in

- Combinatorial materials research
- High throughput film deposition and characterization via robot-based platforms
- Characterization and Processing equipment development
- Big data methods and Machine Learning

for the development of printed solar cells with improved efficiency and stability.

We offer the opportunity for **Masters and Bachelor theses in high-throughput characterization of organic semiconductors and their photovoltaic applications.**

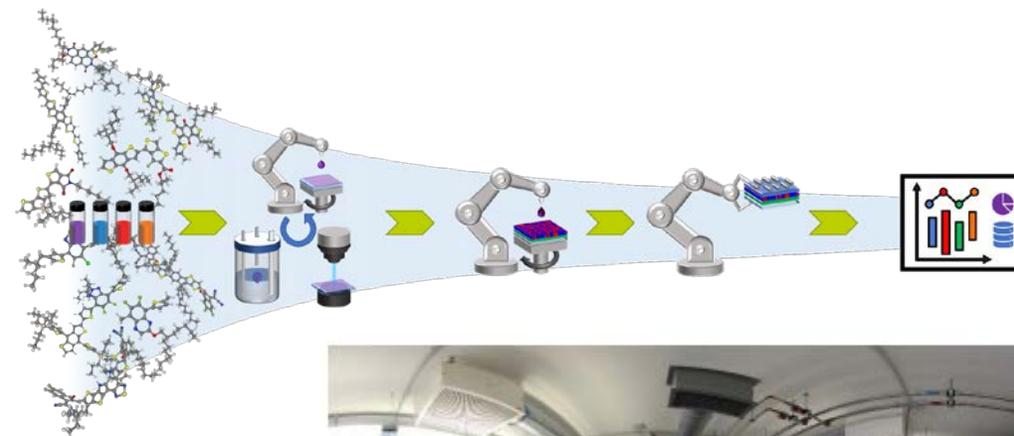
Qualification:

- Currently pursuing a degree in Material Science, Chemistry or a related field
- Strong interest in ML-assisted photophysical and photovoltaic characterization of organic semiconductors
- Proficient in laboratory work with outstanding technical skills or machine learning
- Self-motivated and ambitious

Note: Students of MWT, NT, Energy Technology, Advanced Materials & Processes (MAP) can be directly examined. Students from other disciplines require an examiner from their department.

Recent Publications:

- Aydan Alkan et al., Tuning the Transparency and Exciton Transition of D- π -A- π -D Type Small Molecules, **Chemistry – A European Journal** (2025) <https://doi.org/10.1002/chem.202500657>.
 Wu, Aydan Alkan et al., Highly Stable Sn–Pb Perovskite Solar Cells Enabled by Phenol-Functionalized Hole Transporting Material, **Angewandte Chemie** (2025) <https://doi.org/10.1002/ange.202424515>.
 Wu et al., Integrated System Built for Small-Molecule Semiconductors via High-Throughput Approaches, **Journal of the American Chemical Society** (2023) <https://doi.org/10.1021/jacs.3c03271>
 Wagner, J. et al. The evolution of Materials Acceleration Platforms: toward the laboratory of the future with AMANDA, **Journal of Material Science** (2021) <https://doi.org/10.1007/s10853-021-06281-7>
 Langner et al., Beyond Ternary OPV: High-Throughput Experimentation and Self-Driving Laboratories Optimize Multicomponent Systems, **Advanced Materials** (2020) <https://doi.org/10.1002/adma.201907801>
 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>



Contact:

Ecem Alkan, MSc
 Immerwahrstr. 2, 91058 Erlangen
ecem.alkan@fau.de
 +49 9131 12538328