

# Master- and Bachelor Theses in Process Development for Printed Photovoltaics

The group “Solar Factory of the Future”, located on the Energy Campus Nürnberg, develops concepts, architectures, processes, and equipment for manufacturing printed photovoltaic modules.

We offer the opportunity for **Master and Bachelor theses in Organic and Perovskite Photovoltaic (PV) module manufacturing, characterization, optimization, and application.**

- Possible topics:
- Development of high throughput methods/quality control for process optimization
  - Ink jet printing of multi color organic PV modules
  - Optimization of perovskite PV modules on flexible substrates
  - Development of encapsulation of perovskite PV modules
  - Failure analysis of printed PV modules
  - Development of Printed Busbars for Organic Photovoltaic Modules
  - Development of Organic Photovoltaics without Need for (UV-)Light Activation

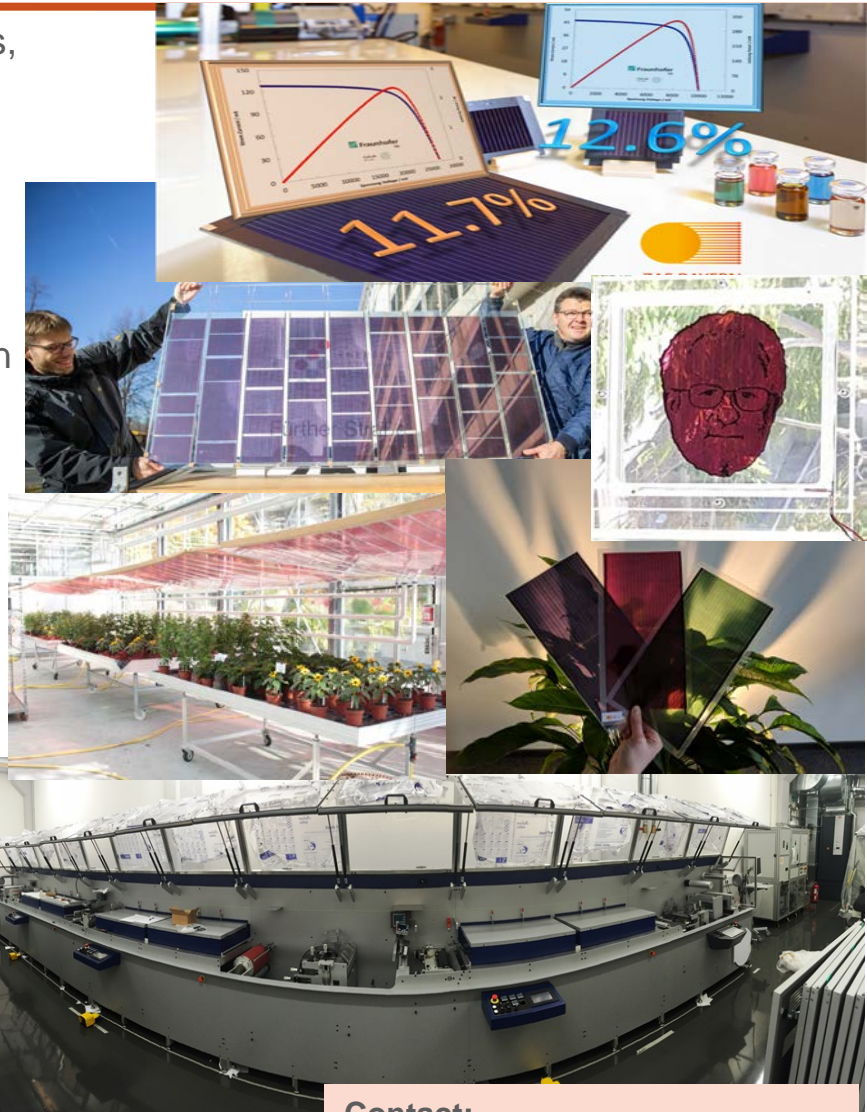
## Qualification:

- Student of Materials Science, Nanotechnology, Energy Technology, Process Engineering, Physics or comparable
- Comfortable in a lab environment with excellent technical ability
- and/or Electronics / Mechatronics background / experience with numerical simulations

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:

- A. Distler, C.J. Brabec, H.-J. Egelhaaf, “Organic Photovoltaic Modules with New World Record Efficiencies”, *Progr. Photovoltaics* **29** (2021) 24 – 31.  
M.K. Hamjah, M. Steinberger, et al., “Aerosol jet printed AgNW electrode and PEDOT: PSS layers for organic light-emitting diode devices fabrication”.  
In *2021 14th International Congress Molded Interconnect Devices (MID)* (pp. 1-4). IEEE.  
C.J. Brabec, A. Distler, X. Du, H.-J. Egelhaaf, J. Hauch, T. Heumueller, N. Li, “Material Strategies to Accelerate OPV Technology Toward a GW Technology”, *Adv. En. Mater.* **10** (2020) 2001864.  
F. Yang, L.R. Dong, D.J. Jang, K.C. Tam, K.C. Zhang, N. Li, C.J. Brabec, H.-J. Egelhaaf, “Fully Solution Processed Pure  $\alpha$ -Phase Formamidinium Lead Iodide Perovskite Solar Cells for Scalable Production in Ambient Condition”, *Adv. En. Mater.* **10** (2020) 2001869.  
P. Maisch, K.C. Tam, D. Jang, M. Steinberger, F. Yang, C.J. Brabec, H.-J. Egelhaaf. „Inkjet printed organic and perovskite photovoltaics—review and perspectives”. In *Organic Flexible Electronics* (pp. 305-333).  
I.A. Channa, A. Distler, M. Zaiser, C.J. Brabec, H.-J. Egelhaaf, “Thin Film Encapsulation of Organic Solar Cells by Direct Deposition of Polysilazanes from Solution”, *Adv. En. Mater.* **9** (2019) 1900598



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