

“The **Computational Physics For Green Energy (CP4GE)** research group conducts advanced research in the field of renewable energies, leveraging sophisticated **computer simulations**. By utilizing high-level **numerical methods**, we address both fundamental scientific questions and concrete industrial applications in close collaboration with our strategic partners. To ensure the successful **implementation** of our research objectives, we are seeking motivated students for project work, bachelor’s or master’s theses, and positions as research assistants. Candidates should demonstrate a strong interest in **computer-aided simulation** and contribute to our mission of advancing **Green Energy** solutions through technical excellence.”

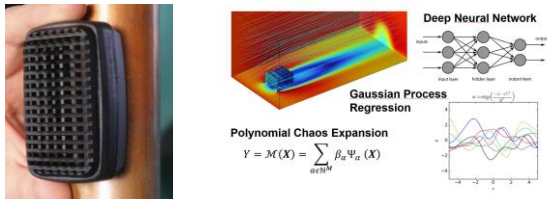
Fields of research with open positions:

A) Energy Harvesting

Energy harvesters convert ambient energy into electrical energy. Different technologies exist from thermoelectrical, solar and vibrational harvesting – and we optimize these harvesters for each specific use case with our computer models!

- surrogate models of energy harvesters
- physics-informed neural networks

(Partners: Fraunhofer IIS + European)

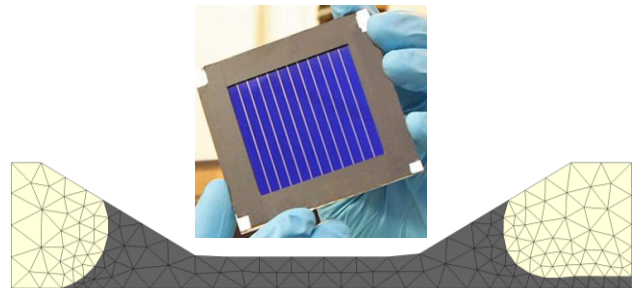
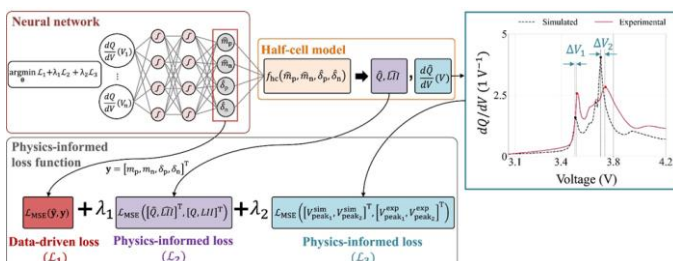


B) Energy Storage in Batteries

For various applications, energy storages such as Li-Ion batteries are crucial. With our European partners, we help to accelerate and improve the development and testing process by coupled electrochemical, thermal, and mechanical simulations!

- multi-scale + multi-physical COMSOL models
- ageing mechanisms on the molecular scale

(Partners: EnCN + European)

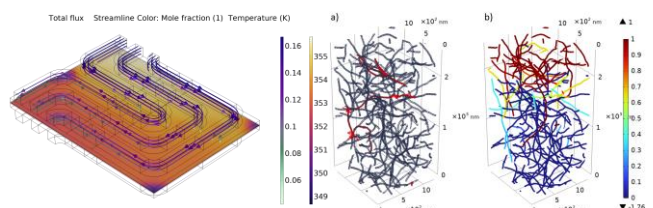


C) Organic Photovoltaic Processing (OPV)

OPV allows multiple new applications in the field of solar energy. However, manufacturing large modules of OPV is challenging – we help to understand and improve this process by state-of-the-art multi-phase simulations of the printing process!

- CFD numerical simulations with OpenFoam
- statistical printing defect analysis

(Partners: Solarfabrik der Zukunft, FAU)



D) Hydrogen Technology & Fuel Cells

As a multi-purpose energy carrier, hydrogen can be used in PEM fuel cells converting chemical into electrical and thermal energy. With our models, we investigate the degradation mechanism and try to mitigate the underlying effects.

- material simulations for composite materials
- 1D / 2D multi-physical PEM FC models

(Partners: THN research groups)

If you are interested, please contact jan.lohbreier@th-nuernberg.de!