The Institute for Energy and Climate Research 5 – Photovoltaics (IEK-5) performs research on various aspects of photovoltaic materials and devices, including the emerging class of perovskite solar cells. Perovskite solar cells are a promising solar cell technology that enables printable, flexible and lightweight solar cells. To better understand and quantify efficiency losses, researchers use a variety of characterization methods that include various types of spectroscopy methods. Within this project, we will specifically studied the transient photoluminescence method and try to improve data analysis of photoluminescence transients on perovskite layers, layer stacks and complete devices using machine learning techniques. Our approach is based on a variant of Bayesian inference, where we use trained neural networks (supervised learning) to rapidly compare the experimental data with the output of a numerical model.

We are looking to recruit a

**PhD Position – Transient Spectroscopy of Halide Perovskites for Photovoltaics**

**Your Job:**
- Transient photoluminescence measurements of halide perovskite films, layer stacks and devices
- Simulations of transient photoluminescence and generation of training data
- Training of neural networks using the numerical simulations
- Calculating the likelihood of material parameters correctly describing experimental results
- Correlating material parameters with process conditions of sample preparation
- Deriving insights for film and device fabrication based on the above described workflow

**Your Profile:**
- Masters degree in physics, materials science, physical chemistry, electrical engineering and related disciplines
Very good grades in the masters and bachelors degrees are mandatory
Knowledge of semiconductor and solar cell physics is required
Knowledge of solar cell characterization methods and/or drift-diffusion simulations is useful but not mandatory

Our Offer:
We work on highly innovative topics and offer you the opportunity to actively shape the change! We offer you:

- A large research campus with green spaces, offering the best possible means for networking with colleagues and pursuing sports alongside work
- An interesting, future-oriented and socially relevant topic for your thesis
- Interdisciplinary collaboration on projects in an international, dedicated and supportive team
- Qualified supervision by academic colleagues
- Independent preparation and implementation of the assigned tasks
- Ideal conditions for balancing work and private life, as well as a family-friendly corporate policy
- Flexible working hours
- A structured doctoral program for you and your supervisors with a comprehensive range of further training and networking opportunities via the doctoral platform JuDocs (https://www.fz-juelich.de/judocs)
- Targeted services for international employees, e.g. through our International Advisory Service

In addition to exciting tasks and a collegial working environment, we offer you much more: https://go.fzj.de/Benefits

The position is initially for a fixed term of 3 years. The salary is in line with pay group 13 (65%) of the Collective Agreement for the Public Service (TVöD-Bund). In addition, an annual special payment is granted ("Christmas payment"), which amounts to 60% of the monthly salary. Further information on doctoral degrees at Forschungszentrum Jülich (including its various branch offices) is available at https://www.fz-juelich.de/en/careers/phd

We welcome applications from people with diverse backgrounds, e.g. in terms of age, gender, disability, sexual orientation / identity, and social, ethnic and religious origin. A diverse and inclusive working environment with equal opportunities in which everyone can realize their potential is important to us.