

## Helmholtz Call for Chinese Applicants Interested in Running for CSC 2021 Fellowship

**Helmholtz Centre:** Forschungszentrum Jülich GmbH – [www.fz-juelich.de](http://www.fz-juelich.de)  
**Department/Institute:** Institute of Energy and Climate Research, Photovoltaics (IEK-5)  
[https://fz-juelich.de/iek/iek-5/EN/Home/home\\_node.html](https://fz-juelich.de/iek/iek-5/EN/Home/home_node.html)  
**Supervising scientist:** Prof. Dr. Thomas Kirchartz  
**University for registration or for a future degree:** University Duisburg-Essen  
**Research Field:** Photovoltaics  
**Position open for:** **PhD Student x** **Sandwich PhD Student** □  
**Title of the research:** Fundamentals of interfacial recombination in halide perovskite solar cells

### More description of research topic:

Solar cells made from lead-halide based perovskites have been shown to enable efficiencies > 20 % using a solution-based fabrication process. However, the materials currently lack stability and are insufficiently well understood in many respects related to electrostatics and charge carrier recombination in these materials. We are looking for candidates that support our research efforts on improving the understanding of halide perovskite materials, interfaces and devices. The successful candidate would work on the fabrication and characterization of lead-halide perovskite layers, layer stacks and devices. In particular, we are interested in improving material stability e.g. by using stable methyl-ammonium-free combinations of cations. In addition to quality and stability of the active layer, we are also interested in band gap tuning for tandem applications as well as tuning of interfacial layers for increased open-circuit voltages and fill factors. Characterization of solar cells and films will be done using methods such as transient and steady-state photoluminescence, impedance, and photoelectron spectroscopy with the aim to better understand the losses due to recombination and resistive effects as well as to improve device performance.

### Specific requirements:

The successful candidate should have a background in physics, materials science or electrical engineering and be familiar with the fabrication and characterization of semiconductor devices and semiconducting materials (ideally solar cells).

**Working Place:** Forschungszentrum Jülich, Germany (near Cologne)

**Earliest Start:** September 2021

**Language Requirement:** Very good knowledge of English language, written and spoken. German language courses are organised in the context of our in-house training program and are free of charge.

**Name and Address of the Supervisor:** Prof. Dr. Thomas Kirchartz, Institute of Energy and Climate Research (IEK-5), Forschungszentrum Jülich, 52428 Jülich, Germany; [t.kirchartz@fz-juelich.de](mailto:t.kirchartz@fz-juelich.de)