2023 Helmholtz – OCPC – Programme

for the involvement of postdocs in bilateral collaboration projects

PART A

Title of the project:

Mechanisms of Light-induced Changes in Silicon Heterojunction Solar cells and Modules

Helmholtz Centre and/or institute:

Forschungszentrum Jülich GmbH

Project leader:

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Department: (at the Helmholtz centre or Institute)

Institute of Energy and Climate Research, Photovoltaics (IEK-5)

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Description of the project (max. 1 page)**:**

Silicon heterojunction (SHJ) solar cell holds the highest efficiency as of date in the class of silicon-based devices. The cell efficiency showed a steady improvement in the past few years, reached a value of 26.8% for two sides contacted structure. Due to its low temperature processes, low temperature coefficient and high bi-faciality, SHJ solar cell is considered as a promising technology for large-scale terrestrial PV applications. The illumination of SHJ solar cells or modules reveals different performance evolutions from UV wavelength region and blue/infrared wavelength region. The blue/infrared light induced performance improvement, and the UV induced performance degradation were found simultaneously on SHJ solar cells. The growing commercial interest on SHJ solar cells has motivated the research in understanding the underlying causal mechanisms of the light induced changes.

In this project, light-induced changes in SHJ solar cells and modules will be investigated systematically with different light sources. The underlying mechanism for improvement and degradation will be clarified, and solutions for degradation will also be developed.

Description of existing or sought Chinese collaboration partner institute (max. half page)**:**

Shanghai Institute of Microsystem and Information Technology, Chinese Academy and Sciences.
Institute of Solar Energy System, Sun Yat-sen University.
Solar Energy Research Institute, Shanghai Jiao Tong University.
Institute of Electrical Engineering, Chinese Academy of Sciences.

Required qualification of the postdoc:

- Excellent lab and analytical thinking skills
- Laboratory experience on silicon solar cell preparation
- Experience with characterization of solar cells and thin-film materials
- Very good English skills
- Motivation to work in a team