



DLR – DAAD Fellowships

Fellowship No. 465

Research Area : Energy

Research Topic: **Solar Research – Solar Fuels Production**

“Investigation of redox materials for solar fuels and chemicals production - experimental and numerical analysis”

DLR Institute: Institute of Solar Research, DLR Cologne

Position: Postdoctoral Fellow

Openings: 1

Job Specification:

DLR, Solar Research is active in developing processes to store energy from concentrated solar radiation in the form of so-called Solar Fuels or Solar chemical commodities. Typical raw materials are carbon dioxide, water, natural gas or waste materials. To couple solar energy effectively to the respective reactions converting those raw materials into chemical commodities or valuable fuels, specific components like solar reactors and heat exchangers are necessary. The tasks of this postdoctoral position aim at developing and analyse materials and key components for the thermo-chemical conversion of concentrated solar energy, into usable fuels or chemicals. One focus is the basic understanding of material properties and transport phenomena determining the performance and stability of the materials involved and the effectiveness of gas-solid reaction involved. In particular the endothermal step of reducing a metal oxide is in the focus of research and development. The receiver-reactors are under consideration for application in different sizes. The related project comprises the following tasks:

- Functional Material development
- Material characterisation
- Experimental validation of redox materials
- Development of mathematical models of transport phenomena
- Planning of simulated and real on-sun experimental studies

- Reactor design of solar reactors enabling solar processing of functional materials
- Development and application of process model that evaluates the potential of solar thermal fuel and commodity production

Required Qualification: Degree in Material Science, Material Physics, Chemistry or Physical Chemistry, Chemical Engineering
PhD or doctoral degree
Experience in Solar Technologies, in particular in Solar Chemistry
Experience in experiments and modelling

Advantageous Skills: Experience in materials analysis
Experience in kinetical models
Experience in transport phenomena

English competence: **Fluent** - See requirements on www.daad.de/dlr

Earliest Start Date: 1 Nov 2020

Application Deadline: Open

Further Information: <http://www.dlr.de>
<http://www.daad.de/dlr>