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DLR – DAAD Fellowships

Fellowship No. 568

Research Area : Transportation

Research Topic: **Optimized Thermoelectric Materials design by digital twinning and machine learning**

DLR Institute: Institute for Materials Research, DLR Cologne, Germany

Position: Postdoctoral Fellow

Openings: 1

Job Specification: **Thermoelectric devices** are highly versatile solid-state devices that can be used for energy conversion and temperature control by Peltier heat pumps. They can thus serve to optimize thermal management of batteries or fuel cells in hybrid-electric cars or to improve systems efficiency of combustion drives fed by renewable fuels. The device performance of a thermoelectric generator or heat pump is governed by the properties of the thermoelectric materials, thermal boundary conditions, device geometry as well as interface effects and loss mechanisms. For further advancement of these devices and efficient optimization, modelling support complementing experimental work is indispensable.
The fellowship dedicated to these problematics shall therefore address

- Merging together of existing tools for material and device modelling as well as their further development, aiming for device-oriented material and design optimization.
- Integration of a pre-existing material data base with the developed numerical methods.
- Complementing the direct problem (calculation of device properties from material properties) the inverse problem is to be addressed using AI supported methods.

Required Qualification: PhD in physics, mathematics, material sciences, electrical engineering or a related natural or technical science

Strong background in numerical calculations and simulations
Background in thermoelectric materials and/or device modelling
Significant experience in programming in a common language

Significant experience in programming of a common language
Ability to work in an international and diverse team

Advantageous Skills:

Specialist in thermoelectrics and heat transfer
Programming with Python or MATLAB
Interest in scientific and technological challenges
3D - Finite Element Modelling and Multiphysics Simulation (preferably ANSYS)
Experience with machine learning

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

Earliest Start Date: As soon as possible

Application Deadline: Until position filled

Further Information:

http://www.dlr.de
http://www.dlr.de/wf/en/desktopdefault.aspx/tabid-1696/3089_read-3739/
http://www.daad.de/dlr

More information may be obtained by contacting:

Dr. Johannes de Boor (Johannes.deBoor@dlr.de)

Thank you for your attention!
We look forward to receiving your application!