



# UNIVERSITÄT KOBLENZ · LANDAU

The **Departments of Mathematics at the University Koblenz-Landau, Campus Koblenz and Campus Landau**, are inviting applications for two

## **Research Positions in Machine Learning and Optimization methods for Fluid-Structure Interaction (Campus Koblenz), and Hemodynamic Flow simulation involving Fluid-Structure Interaction (Campus Landau) (each 1,0 EGr. 13 TV-L) (m/f/d)**

The positions are subject to the German law on fixed-term contracts in science (WissZeitVG) and are to be filled at the earliest convenience. The positions are available for a fixed time period not extending three years with a maximum duration of the contract until September 30, 2023. The salary for each position is according to 1,0 EGr 13 TV-L. The successful candidates will either work at the Campus Koblenz in the [Modeling, Simulation, and Optimization of Complex Systems Group](#), or at the Campus Landau in the [Numerical Simulation Group](#) of the University Koblenz-Landau.

### **Topic:**

The research positions are associated to the Collaborative Research Project *Development and implementation of Machine Learning methods for the prediction of ischemic strokes* funded by the German Ministry for Education and Research (BMBF). The aim of the project consists in developing computational and mathematical analysis tools to improve clinical pathways in the exploration, analysis and treatment of vasoconstriction to reduce the resulting risk of ischemic stroke. For this purpose new methods of blood flow simulation and machine learning as well as new fluid-structure interaction (FSI) optimization techniques are developed in close collaboration with the other project and clinical application partners.

The group at the Campus Koblenz develops optimization methods for fluid-structure interaction and fast solution algorithms for parameter identification problems of machine learning. In addition, simulation-based hemodynamic reduced order surrogate models are constructed and implemented to accelerate the machine learning algorithms, and are validated on real data together with the clinical application partners.

The group at the Campus Landau develops numerical 3D models and simulation tools for realistic carotid hemodynamic flows regimes involving the fluid-structure interaction and the blood rheology. The simulation results complement the patient data providing the quantification of hemodynamic risk parameters. In collaboration with the clinical partners the simulation data is exported for the training of the ML algorithms.

### **Requirements:**

The successful candidates require a master degree in Applied Mathematics, Mechanical Engineering, Computer Science or Computational Physics, ideally with a strong background in numerical methods for PDEs and nonlinear programming (Campus Koblenz), or experience in numerical fluid mechanics and fluid-structure interaction (Campus Landau). Fluency in both written and spoken English and the ability to work in an interdisciplinary team are mandatory. Additional knowledge in modern scientific programming is desired. Very strong problem-solving skills, willingness to learn, ability to work independently, experience/willingness in writing publications and good presentation skills are essential.

For receiving further information please contact Prof. Dr. Michael Hinze (phone: +49 (0)261/287-2310 or e-mail: [hinze@uni-koblenz.de](mailto:hinze@uni-koblenz.de)) for the positions at the Campus Koblenz, and Prof. Dr. Anna Hundertmark (phone: +49 (0)6341/280-31149 or e-mail: [hundertmark@uni-landau.de](mailto:hundertmark@uni-landau.de)) for the position at the Campus Landau.

It is the policy of the University Koblenz-Landau to increase the percentage of female employees. If equally qualified, preference will be given to female applicants in fields where they are underrepresented. Disabled candidates are given priority, if equally qualified. International candidates are highly encouraged to apply.

Applications should include a letter of motivation, complete curriculum vitae with a list of publications and presentations, certificates etc.

Please send your application, quoting the **reference number Ko 28/2020**, before **July 24, 2020** by e-mail **in a single PDF file** to [bewerbung-K21@uni-koblenz.de](mailto:bewerbung-K21@uni-koblenz.de), with indicating the respective position at Campus Koblenz or Landau, respectively. Applications are accepted until the position is filled.

We do not send a confirmation of receipt. In accordance to the protection of data privacy all documents will be destroyed after the application procedure.

[www.uni-ko-ld.de/karriere](http://www.uni-ko-ld.de/karriere)