FLAIR Colloquium

**Thursday, 14. November 2024, 16:00**
**Room R4/23, Building L6|01**

**Zoom-Link**

# Artificial Design of Quantum Materials by Complex Oxide Heterostructures


**Dr. Dirk Fuchs**
**Institute for Quantum Materials and Technologies**
**Karlsruhe Institute of Technology**



## Abstract

Artificial heterostructures and superlattices provide huge playground for the design of new topological materials displaying exotic or unconventional quantum transport. Perovskite-related 3d, 4d, and 5d transition metal oxides with their plethora of functionalities such as for example magnetisms, ferroelectricity, superconductivity, or even multiferroic ordering due to strong electron correlation or spin-orbit interaction are ideal candidates for such a route of material design because of their rather simple crystalline structure which perfectly serves as “Lego”-brick-like building blocks for new heterostructures. In addition, current state-of-the art thin film deposition techniques allow the preparation of such heterostructures with a precision of the layer-thickness on the atomic-scale. The main issue of this talk, is on the preparation of 3d and 5d transition-metal oxide heterostructures via pulsed laser deposition and the characterization of structural and electronic properties with respect to proximity-induced effects at the 3d/5d interface.