



EINLADUNG zum IFP-SEMINAR

Oxide thin films and interfaces with emergent electronic and magnetic functionalities

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Host: Karsten Held

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Transition metal oxides exhibit rich phase diagrams and exotic physical properties as a result of strong correlations between multiple degrees of freedoms. The recent advance of thin film growth techniques allows the synthesis of high-quality epitaxial oxide heterostructures with precise thickness, structure and composition controls. In this presentation, I will first discuss the emerging opportunities to construct interface-based nonvolatile resistive switching memory and field effect transistor. Electrostatic bias can manipulate the configuration of charged defects, and tune the Kondo effect and two-dimensional insulator-to-metal transition. I will also discuss the emergence of exchange bias and reentrant spin glass state at interfaces between ferromagnetic and antiferromagnetic oxides. Finally, I will introduce our preliminary result of superconductivity in orthorhombic-structured Ti_2O_3 films. The basic principles of materials physics behind these emergent physical properties of oxide interfaces might provide opportunities of future technology breakthroughs.



Dr. Tao (Tom) Wu received his B.S. degree from Zhejiang University in 1995 and Ph.D. degree from the University of Maryland, College Park in 2002. Before joining King Abdullah University of Science and Technology (KAUST) in 2013, he worked in Argonne National Laboratory in Chicago and Nanyang Technological University (NTU) in Singapore. Dr. Wu has authored/ co-authored nearly 200 peer-reviewed papers in the broad areas of oxide thin films, nanomaterials, and hybrid perovskites, with a focus on their electronic, magnetic and optical functionalities. He also serves as Associate Editor for ACS Applied Materials & Interfaces. Group website: <http://nanooxides.kaust.edu.sa>