

# DIESE WOCHE

## PHYSIKALISCHES KOLLOQUIUM

des Fachbereichs Physik  
der Johann Wolfgang Goethe-Universität Frankfurt

Mittwoch, den 15.07.2015, 16 Uhr c.t.  
Großer Hörsaal, Raum \_0.111,  
Max-von-Laue-Str. 1

**Prof. Dr. Ralph Claessen**  
Physikalisches Institut and  
Röntgen Research Center for Complex  
Material Systems (RCCM),  
Universität Würzburg

*"Interface physics  
of complex oxide heterostructures:  
New opportunities for electronics"*

The physics of modern semiconductor technology is based on interface physics, i.e. on charge carriers moving at the boundary between differently doped regions or different materials. While the properties of Si- or GaAs-derived heterostructures is governed by relatively simple one-electron physics, fascinating new functionalities can arise when interfacing complex transition metal oxides with their rich many-body physics, ranging from magnetism to metal-insulator transitions to superconductivity. Recent progress in epitaxial thin film growth of ternary (or even more complex) compounds by, e.g., pulsed laser deposition (PLD) has made it possible to fabricate oxide heterostructures and superlattices with atomically sharp interfaces. Additionally, new methods based on x-ray and electron spectroscopy have been developed which provide direct experimental access to the electronic properties of the buried interfaces. In my presentation I will discuss various examples of the new field of "oxide electronics". I will particularly focus on the two-dimensional electron liquid (2DEL) forming at the interface between the insulators LaAlO<sub>3</sub> and SrTiO<sub>3</sub>, which not only displays an unusually high mobility, but can also be controlled by electric field effect

Die Dozenten der Physik

# Kolloquium