

## Electronic and ionic conduction in oxide heterostructures

Nini Pryds

*Department for Energy Conversion and Storage, Technical University of Denmark, DK-4000  
Roskilde, Denmark*

*nipr@dtu.dk*

The conductance confined at the interface of complex oxide heterostructures provides new opportunities to explore nanoelectronic as well as nanoionic devices. In this talk I will present our results both on ionic and electronic conductivity at different heterostructures systems. In the first part of my talk I will show some of our recent results where we demonstrated the possibility of stabilizing  $\delta$ -Bi<sub>2</sub>O<sub>3</sub> using highly coherent interfaces of alternating layers. These confined heterostructures provide a playground not only for new high ionic conductivity phenomena that are sufficiently stable but also uncover a large variety of possible technological perspectives. At the second part, I will discuss and show what is happening when two oxides intimately contact each other, charge redistribution or mass transfer of ions may occur. Here, I will present the recent activities of our group in this area where we try to push the mobility to record high values and realization of quantum Hall effect in these films. These findings pave the way for studies of mesoscopic physics with complex oxides and design of high-mobility all-oxide electronic devices.