



The Hebrew University Center
for Nanoscience & Nanotechnology



Nano Seminar

When two insulators become electronics – A peek into the field of oxide nanoelectronics

Prof. Nini Pryds

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

Abstract:

The conductance confined at the interface of complex oxide heterostructures provides new opportunities to explore nanoelectronic as well as nanoionic devices. When two oxides intimately contact each other, charge redistribution or mass transfer of ions may occur. Herein we show interfacial redox reaction induced metallic conductivity along the interface of SrTiO₃-based heterostructures with various oxide overlayers of amorphous LaAlO₃, SrTiO₃ (STO) and yttria-stabilized zirconia (YSZ) films. One of the major and long-standing challenges of oxide 2DEGs is still to understand how to enhance the electron mobility. The mobility is still orders of magnitude lower than that of the conventional semiconductors and with the current fabrication method we still cannot fully control the charge at the interface. Here, I will present the recent activities of our group in this area where we try to push the mobility to record high values, i.e. the usage of the so-called modulation-doping technique has significantly increased the carrier mobility to mobility of 70.000 cm²/Vs 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.

Gathering & Refreshments at 10:50

Please contact Alexandra Bannykh at 6584919 if you are interested in meeting the lecturer.

Monday, Dec 12th 2016, 11:00 at the Seminar Hall

Los Angeles Building, entrance floor.