



## Einladung

Es spricht: **Dr. Sylke Blumstengel**  
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Zeit: **Freitag, 04. November 2016, 10:15 Uhr**

Ort: **Technische Universität Berlin  
Institut für Festkörperphysik  
Hardenbergstraße 36, 10623 Berlin  
Raum EW 561**

Thema: **„Excitonic coupling and formation of hybrid charge transfer excitons at ZnO/organic interfaces“**

### **Abstract:**

ZnO is attracting significant interest as a candidate for hybrid photovoltaic and light-emitting devices. We studied electronic coupling at interfaces of ZnO with conjugated organic molecules like ladder-type oligo(phenylenes) (LOP) whose fundamental optical excitations are resonant to the ZnO band gap as well as with polymers employing optical and photoemission spectroscopy.

Our studies provide evidence for the formation of hybrid charge transfer excitations (HCTE) across (Zn,Mg)O/organic interfaces. We show that by interfacial design the properties of these HCTE can be tuned and by that the charge separation process. The impact of the HCTE on photovoltaic parameters like the open circuit voltage and short circuit current is demonstrated in (Zn,Mg)O/P3HT diodes.

Furthermore, we show that by proper alignment of the frontier molecular orbitals with the semiconductor valence and conduction band edges, exciton dissociation at the hybrid interface can be switched off while exciton transfer efficiencies of up to 80 % are maintained. Thus, efficient conversion of ZnO excitons into highly emissive excitons of the organic (LOP) layer is achieved which is essential for the realization of hybrid light-emitting diodes.

Gäste sind herzlich willkommen!  
Prof. Dr. M. Kneissl