

O 98: Nanostructures at Surfaces: 1D Systems

Time: Thursday 15:00–16:00

Location: WIL C307

Invited Talk

O 98.1 Thu 15:00 WIL C307

Spin-charge transport phenomena on the atomic scale —
•CHRISTOPH TEGENKAMP — Institut für Festkörperphysik, Leibniz
Universität Hannover, Germany

Low dimensional metallic structures, e.g. quantum wires and films on surfaces, reveal fascinating phenomena of condensed matter physics. Among others, 2D-superconductivity, formation of charge density waves and topologically protected edge states were realized lately with atomic precision and directly probed by electronic transport. Generally, the surface science approach benefits from the fact that the low dimensional systems can be comprehensively characterized and manipulated in view of their atomic structure and electronic bands. This is a prerequisite to understand electronic transport on the atomic scale. In this talk I will introduce the technique of surface sensitive transport and highlight some recent examples of our group from seemingly different fields, e.g. spintronic, correlated materials and mesoscopic physics. Besides epitaxial Bi-semimetal films with magnetic impurities the talk covers spin-orbit density wave driven metal-insulator transitions in Pb-wires as well as ballistic transmittance of electrons in graphene nanostructures.

Invited Talk

O 98.2 Thu 15:30 WIL C307

Electronic properties of functional organic materials at surfaces —
•PETRA TEGEDER — Ruprecht-Karls-Universität Heidelberg,
Physikalisch-Chemisches Institut

For improvement and optimization of the performance of organic molecule-based devices, comprehensive insight into the physical and chemical properties of the organic material at surfaces is necessary.

I will present two case studies in which we investigated the electronic properties of organic/inorganic hybrid systems, namely graphene nanoribbons (GNRs) on gold surfaces and photochromic molecular switches on silicon. The GNRs are generated using a bottom-up approach based on a thermally activated and surface-assisted reaction of suitable precursor molecules. We studied the effect of N-doping on the energy level alignment. Additionally, we identified excitonic states in GNRs on gold surfaces. Incorporating photochromic molecules into organic/inorganic hybrid materials can lead to photoresponsive systems. In such systems, the second-order nonlinear optical (NLO) properties can be controlled via external stimulation with light at an appropriate wavelength, which we could demonstrate.