



Einladung zum Vortrag

Electronic and magnetic interactions in hybrid nanostructures

anlässlich des Habilitationsverfahrens
für das Fach “ Experimentelle Festkörperphysik ”

von

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Termin: Donnerstag, 18.03.2021, 14:30 Uhr

Ort: Zoom Meeting

<https://zoom.us/j/2731921910?pwd=U1BwTzRGWE81RU1UV2Q4TGNKZDhaUT09>

Abstract:

My research is focused on electronic and magnetic interactions in low-dimensional molecular nanostructures, such as carbon nanotubes (SWCNTs), fullerenes and metal-organic frameworks (MOFs). SWCNTs are one-dimensional (1D) conductors in which quantum confinements along the tube's circumference leads to unique 1D electronic properties, e.g. the van Hove singularity and Tomonaga-Luttinger-liquid. In turn, MOFs represent a class of porous coordination compounds that consist of metal nodes and organic ligands to form 1D, 2D and 3D nanostructures that exhibit advanced optical, electronic and magnetic properties. The interior spaces of such nanostructures allow foreign atoms and molecules to be assembled in low dimensions as well as to functionalize the host nanostructures. While clusters and molecules that are arranged in low dimensions can outperform their bulky counterparts, optimally functionalized SWCNTs and MOFs with defined properties can be implemented in electronic devices such as sensors, smart windows, batteries and solar cells. My research, by means of various experimental techniques such as photoemission, Raman, ultraviolet-visible absorption spectroscopy, X-ray diffraction, electron microscopy, magnetisation and magneto-transport measurements, aims at understanding low-dimensional properties of MOFs and SWCNTs functionalized by chemical and electrochemical doping, and elucidating electronic and magnetic interactions at guest-host molecular interfaces that are responsible for their advanced physical properties.