



TECHNISCHE UNIVERSITÄT
CHEMNITZ

Institut für Physik Physikalisches Kolloquium



Mittwoch, 27.06.2018, um **15:00 Uhr**

Ort: Reichenhainer Str. 90;
Zentrales Hörsaal- und Seminargebäude,
Raum 2/N013

Prof. Dr. Wulf Wulfhekel

Karlsruhe Institute of Technology (KIT)

Switches, magnetic memories and sensors with single molecules on surfaces

Modern lithography used in top-down processes allows to create structures down to the size of 10nm. Due to the unavoidable scatter on the atomic scale, the minimal feature sizes are limited and will be reached in the near future. A solution to this problem is to use a bottom-up process in which the function of the device is realized using atomically precise structures, i.e. molecules.

We will give an overview on our activities of molecules adsorbed on surfaces to realize simple functions related to the spin, the mechanical degrees of freedom and a combination of both. These include spin transport and magnetoresistance through molecules [1,2], molecular exchange bias effect [3,4], molecular memristors [5] and spin-memristors [6]. All of these are two-terminal devices in which molecules are adsorbed on metallic surfaces and are contacted with the tip of a scanning tunneling microscope at cryogenic temperatures. This approach not only allows to measure electron transport through single molecules but also to read and write magnetic information from/to single molecules and to measure molecular forces down to the thermal precision limit at 4K.

- [1] S. Schmaus et al., Nature Nanotech. 6, 185 (2011).
- [2] A. Bagrets et al., Nano Letters 12, 5131-5136 (2012).
- [3] M. Gruber et al., Nature Mater. 14, 981 (2015).
- [4] M. Gruber et al, Nano Letters 15, 7921 (2015).
- [5] L. Gerhard et al., Nature Comm.8, 14672 (2017).
- [6] T. Miyamachi et al., Nature Comm. 3, 938 (2012).



Alle Zuhörer sind ab 14:45 zu Kaffee und Tee vor dem Hörsaal eingeladen.

Informationen zum Vortrag erteilt:
Prof. Dr. Christoph Tegenkamp, Tel. 0371 531 33103

www.tu-chemnitz.de/physik