Stuttgarter Physikalisches Kolloquium

Fachbereich Physik, Universität Stuttgart
Max-Planck-Institut für Festkörperforschung
Max-Planck-Institut für Intelligente Systeme

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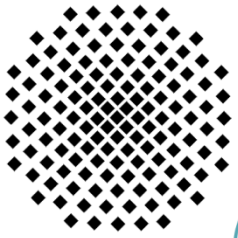

Dienstag, 16. Mai 2017	17:15 Uhr	Hörsaal V 57.01

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Exploring Mott physics and quantum phase transitions in molecular solids

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Abstract

Strong electron-electron interactions are the source of intriguing phenomena such as novel types of superconductivity, multiferroicity or spin liquid behavior. In recent years, molecular solids, made up of molecular building blocks have emerged as suitable model systems for exploring these fascinating states of matter under well-controlled conditions.

In this talk we will discuss various examples where molecular-based materials help address fundamental aspects of correlated electrons. This includes the Mott metal-insulator transition, a paradigm of strong electron-electron interactions, and the question to what extent the ionic lattice is involved in this transition [1]. Moreover, we will discuss quantum phase transitions, $T = 0$ transitions driven by quantum fluctuations. We demonstrate that this transition, although inaccessible by experiment, can be used for realizing a highly efficient magnetic cooling [2].

[1] E. Gati *et al.*, Science Advances **2**, e1601646 (2016).
[2] B. Wolf *et al.*, PNAS **108**, 6862 (2011).