Stuttgarter Physikalisches Kolloquium

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

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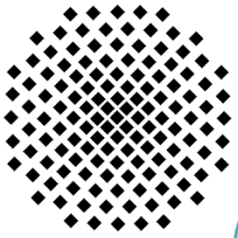

Dienstag, 16. Oktober 2018	16:00 Uhr c.t.	Hörsaal V 57.01

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Quantum Microscopy – exploring matter at the limit of size, speed and energy

Sebastian Loth - Antrittsvorlesung
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Abstract

Smaller and faster is the paradigm of information technology. But how small and how fast can we go? Ultimately, the answer will be determined at the quantum limit by the fundamental processes governing electron motion in matter. I will outline the development of new microscopes that can atomically resolve such electron charge and spin dynamics at their intrinsic femtosecond time scales. These tools reveal the interplay of electron interaction, local atomic structure and nanoscale fluctuations that lead to the emergence of magnetism and are essential to correlated-electron behavior.

I will show two recent advances made with these microscopes: One, in which we assemble few-atom spin chains that can be designed to be sensitive detectors for their nanometer-scale environment; and one in which we detect previously hidden coherent motion of electrons in a charge-density wave state at atomic pinning sites.