Spin correlations as revealed by the STM

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The scanning tunneling microscope (STM) is instrumental when analyzing matter on the atomic scale. Not only has it sub-atomic spatial resolution, but it is well below the milli-eV energy scale, which allows it to map the spectral function of complex systems with unprecedented resolution. The advent of milli-Kelvin techniques is also of fundamental importance when studying magnetism on the nanoscale. An emerging full field of magnetic inelastic electron spectroscopy (IETS) [1] is permitting us to unravel the microscopic origin of magnetism on the nanoscale. Our work deals with the understanding and numerical simulation of all these phenomena on the atomic scale. Hence, I will present numerical studies on metallic phthalocyanine molecules on Ag (100) [2] which gives unprecedented insight in molecular magnetism on a non-magnetic host. Correlations, high spins and the Kondo effect can be found here. Excitations are naturally seen by the STM-based experiments, and excita tions are very interesting when combined with the Kondo effect [3]. Finally, I will talk about the intrinsic correlations appearing in anfiferromagnets, and how this leads to a handle on spin manipulations [4].

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