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Quantum gas microscopy of strongly correlated fermions

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The manipulation and detection of quantum many-body systems down to the level of single particles offer a totally new paradigm to study strongly correlated phases.
In particular, spin-resolved quantum gas microscopy [1,2] allows to directly measure arbitrary N-point correlations involving both spin and density, which opens fascinating perspective for experiments.
I will discuss here recent experimental studies concerning the interplay between doping and magnetism in the Fermi-Hubbard model via quantum gas microscopy.
In particular, I will report on fundamental differences between doped one (1d) and two-dimensional (2d) Mott insulators revealed by direct signatures of spin-charge separation in 1d, magnetic polarons and Fermi-liquid in 2d.

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