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Quantum gas microscopy of strongly correlated fermions

G. Salomon[a,b,g,h*], J. Koepsell[a,b], P. Sompet[a,b], J. Vijayan[a,b], D. Bourgund[a,b], S. Hirthe[a,b], M. Boll[a,b], T. Hilker[a,b], A. Omran[a,b], A. Bohrdt[b,c], Y. Wang[d,e], F. Grusdt[b,f], J. Nespolo[f], C. Gross [a,b,i], L. Pollet[f], E. Demler[d], and I. Bloch[a,b,f]

a. Max-Planck-Institut für Quantenoptik, 85748 Garching, Germany

b. Munich Center for Quantum Science and Technology (MCQST), 80799 München, Germany

c. Department of Physics and Institute for Advanced Study, Technical University of Munich, 85748 Garching, Germany

d. Department of Physics, Harvard University, Cambridge, Massachusetts 02138, USA

e. Department of Physics and Astronomy, Clemson University, Clemson, South Carolina 29631, USA

f. Fakultät für Physik, Ludwig-Maximilians-Universität, 80799 München, Germany

g. Institut für Laserphysik, Universität Hamburg, Germany

h. The Hamburg Centre for Ultrafast Imaging, Universität Hamburg, Luruper Chaussee 149, 22761 Hamburg, Germany

i. Physikalisches Institut, Eberhard Karls Universität Tübingen, 72076 Tübingen, Germany

* email : guillaume.salomon@uni-hamburg.de

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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