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Microscopic studies of doped cold-atom Fermi-Hubbard antiferromagnets GEOFFREY JI, CHRISTIE CHIU, Harvard University, ANNABELLE BOHRDT, Technical University of Munich and Harvard University, MUQING XU, Harvard University, JUSTUS BRGGENJRGEN, Harvard University and University of Hamburg, MICHAEL KNAP, Technical University of Munich, EUGENE DEMLER, FABIAN GRUSDT, DANIEL GREIF, MARKUS GREINER, Harvard University — Ultracold fermions in optical lattices offers new perspectives for studying the physics of strongly correlated materials. We use this experimental platform to implement the Fermi-Hubbard model, a paradigmatic model thought to capture the physics of high-temperature superconductivity, the pseudogap, and other phenomena containing longstanding open questions. The additional tool of quantum gas microscopy enables site-resolved readout and access to projections of the many-body wavefunction in the Fock basis. We report on our most recent studies of doped antiferromagnets in 2D, where there is no universally agreed-upon mechanism describing the interplay between hole motion and antiferromagnetic order.

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