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Progress toward the Disordered Hubbard Model WILLIAM MCGEHEE, STANIMIR KONDOV, JOSHUA ZIRBEL, BRIAN DEMARCO, University of Illinois at Urbana-Champaign — We report on progress towards experimentally realizing the disordered Fermi-Hubbard model using ultra-cold ^{40}K atoms confined in a disordered optical lattice. As a first step, we have demonstrated Anderson localization of a spin-polarized gas in an optical speckle potential. We will discuss the measured effect of weak interactions on localization. In order to reach the strongly correlated limit, we will combine this disordered potential with an optical lattice to realize the disordered Fermi-Hubbard model. This approach circumvents the difficulty of theoretical analysis and direct measurements in materials.

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