Two-dimensional Fermi gases

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Systems of interacting Fermions are ubiquitous in nature. They exhibit fascinating phenomena like superconductivity, quantum magnetism, superfluidity of 3He, and the anomalous rotation of neutron stars. Ultracold atomic Fermi gases allow for a particularly clean experimental realization of these quantum many-body systems and for addressing long-standing open questions. In this talk, we focus on situations in which the motion of particles is confined to two-dimensional layers. Such low-dimensional, interacting many-body systems bear subtle effects, which are not encountered in three dimensions. We will review our recent experiments regarding quasiparticle spectroscopy, spin diffusion measurements and in-situ observation of Mott-insulating domains.