Optically trapped, ultra-cold gases of spin $\frac{1}{2}$-up and spin $\frac{1}{2}$-down $^6$Li atoms model high temperature superconductors, neutron matter, and even the quark-gluon plasma. A bias magnetic field tunes the gas to a collisional (Feshbach) resonance, where the dilute atomic cloud becomes the most strongly interacting, non-relativistic fluid known: Shock waves are produced when two clouds collide. I will describe our recent studies of fermion pairing in such systems with variable interaction strength. By controlling confinement, we investigate evolution of pairing from 3D to 2D in harmonic, periodic, and double-periodic potentials. Using radio-frequency spectroscopy and direct observations of cloud density distributions, we measure the pairing energy and study its effects on the thermodynamics of two-component balanced and imbalanced gases.

**Friday November 2, 2018**  
**2:15 PM**  
**DeLoach Hall, Room 212**  

Refreshments will be served