**Theory of BCS-BEC crossover in altracold atomic Fermi gases in the presence of impurities**[1] QIJIN CHENS, Zhejiang University — We present a theory of BCS-BEC crossover in ultracold atomic Fermi gases in the presence of nonmagnetic impurities, for variable impurity strength from the Born to the unitary limit. The particle-particle scattering T-matrix and the impurity scattering T-matrix will both be considered self-consistently at the same time, in either a 3D continuum or an optical lattice. Result of $T_c$, the chemical potential $\mu$ and the excitation gap $\Delta$ as well as the order parameter $\Delta_{SC}$, will be presented as a function of impurity strength and impurity density, and will also be compared with the case of $d$-wave pairing such as in high $T_c$ superconductors. References: Q.J. Chen and J.R. Schrieffer, Phys. Rev. B 66, 014512 (2002).

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