

Phase diagram of imbalanced Fermi systems

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I will report on a comprehensive study of the phase structure of paired fermionic system featuring a condensate at non-zero imbalance between two species at finite temperature. We find a rich phase diagram comprising three superfluid phases, namely a Larkin-Ovchinnikov-Fulde-Ferrell phase, the ordinary BCS phase, and a heterogeneous, phase-separated BCS phase, with associated crossovers from the latter two phases to a homogeneous or phase-separated Bose-Einstein condensate of dimers. The phase diagram contains two tricritical points (one a Lifshitz point), which may degenerate into a single tetra-critical point for some degree of imbalance.