

Prof. Raghu Srinivas (Rice University/Stanford): Superconductivity in the repulsive Hubbard model: an asymptotically exact weak coupling solution

Tuesday, August 17, 2010 11:00 AM (1 hour)

We study the phase diagram of the Hubbard model in the limit where U , the onsite repulsive interaction, is much smaller than the bandwidth. We present an asymptotically exact expression for T_c , the superconducting transition temperature, in terms of the correlation functions of the non-interacting system which is valid for arbitrary densities so long as the interactions are sufficiently small. Our strategy for computing T_c involves first integrating out all degrees of freedom having energy higher than an unphysical initial cutoff Ω_0 . Then, the renormalization group (RG) flows of the resulting effective action are computed and T_c is obtained by determining the scale below which the RG flows in the Cooper channel diverge. We prove that T_c is independent of Ω_0 .

Primary author: Prof. RAGHU, Srinivas (Rice University/Stanford)