Session 21bB

Superconductivity in the Cuprates and Ruthenates viewed from a Renormalization Group Approach **21bB1**

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Altho' the cuprates are strongly correlated, models with moderate coupling where RG methods can be applied are of interest. Honerkamp and Salmhofer formulated a RG theory for 2-dim fermions with temperature as the flow parameter to describe the competition between itinerant antiferromagnetism and ferromagnetism when the Fermi energy lies at or near the van Hove singularity and between d-wave and p-wave pairing which appear in the vicinity of these magnetic instabilities. The former is relevant for the cuprates while the latter can be related to p-wave pairing in Sr_2RuO_4. These RG calculations shed new light on the breakdown of Landau theory and the pseudogap phase in the underdoped region.

Theory of Underdoped Cuprates **21bB2**

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Recent experimental progress on (heavily) underdoped cuprates urges the theoretical studies from new perspectives. Especially the metallic conduction and "Fermi arc" in ARPES in the small doping region ($x \sim 0.01$) has to be taken into account. I will discuss the new variational wavefunction for underdoped t-J model, which shows a small hole pocket but is not superconducting. Also this wavefunction can explain the various features obtained by the exact diagonalization study for a single hole. This work has been done with collaboration with A. Mishchenko, Z. X. Shen, A. Lanzara, S. Ishihara, M. Onoda, T. K. Lee, C. M. Ho, S. Maekawa, and T.Tohyama.

21bB3 Cuprate Ladders

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We will discuss the charge, spin, current and pairing correlations found on various cuprate ladder models and their implications for the high T_c problem.