

Seminar

Strong local bosonic fluctuations: key to understanding strongly correlated metals

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Understanding strongly correlated metals remains a central challenge in condensed matter physics. In this talk, we present a novel self-consistent theoretical framework to study the extremely correlated Fermi liquid (ECFL) phase within the $U=\infty$ Hubbard model. By deriving and solving equations of motion for the Green's function and local bosonic correlation functions—representing charge and spin fluctuations—we uncover a natural mechanism for the crossover from coherent Fermi liquid behavior to incoherent regimes. The resulting self-energy and resistivity calculations exhibit canonical Fermi liquid behaviour at low temperatures and linear-in- T resistivity at higher temperatures, capturing key signatures of "strange metal" physics. Our results emphasise the central role of quantum diffusive local bosonic fluctuations in determining electronic dynamics in strongly correlated systems.

Thursday, Jun 26th 2025

11:30 Hrs (Tea / Coffee 11:15 Hrs)

Seminar Hall, TIFRH