



SÉMINAIRE MATIÈRE CONDENSÉE

Jeudi 22 janvier 2026 à **11h**

LPS, bât 510, **Moyen amphi + ZOOM** (en ligne)

Meeting ID: 991 8607 8327; **Password:** LPS91405

Spin and charge criticality in the (pseudogap) two-impurity Anderson model

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The Kondo effect originates from spin screening of localized impurities by conduction electrons. This Kondo screening can be suppressed by a fermionic bath following a pseudogap (i.e. power-law) density of states, by inter-impurity interactions, or by coupling to multiple conduction channels.

We investigate the two-impurity Anderson model in various limits, and establish mappings to known Kondo and Anderson models. This leads to rich phase diagrams with Kondo-breakdown transitions of distinct universality classes giving rise to non-Fermi-liquid behavior. We analyze the phase diagram, and critical exponents of the pseudogap two-impurity Anderson model in the particle-hole symmetric, $SU(2)$ -invariant case using perturbative renormalization-group techniques. We recover the transitions of the pseudogap single-impurity Anderson model, and find additional Kondo-breakdown quantum transitions to inter-impurity singlet-, triplet- and new charge-ordered phases. At the quantum critical points, superconducting-pairing susceptibilities can be enhanced depending on the type of spin- and charge criticality.

We discuss connections to heavy-fermion systems and two-quantum-dot realizations where quantum dots act as tunable magnetic impurities.