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Kondo effects in multi-level quantum dots

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Kondo physics in semiconducting quantum dots coupled to metallic leads is commonly associated with a single 'active' dot level, and hence with the spin-1/2 Kondo effect. But this is not ubiquitously so: if several dot levels are relevant to charge transport, higher spin Kondo effects may arise, and have been observed experimentally. This talk will discuss a two-level, correlated quantum dot coupled to conducting leads, studied largely via RG. Particular consideration will be given both to the spin-1 and spin-1/2 Kondo regimes which occur on sweeping the dot levels through the Fermi level by tuning a gate voltage; and to the nature of the resultant quantum phase transition between the two regimes occurring in a two-lead, one-channel setup. Comparison to experiment, in the form of zero-bias conductance measurements and differential conductance maps, will also be made.