



## سمینار هفتگی گروه اطلاعات کوانتومی

سه‌شنبه ۱۳۹۳/۱۰/۹، ساعت ۱۵:۰۰، اتاق شورا

# An order parameter for impurity systems at quantum criticality

Abolfazl Bayat  
University College London

### Abstract

A quantum phase transition may occur in the ground state of a system at zero temperature when a controlling field or interaction is varied. The resulting quantum fluctuations which trigger the transition produce scaling behavior of various observables, governed by universal critical exponents. A particularly interesting class of such transitions appear in systems with quantum impurities where a non-extensive term in the free energy becomes singular at the critical point. Curiously, the notion of a conventional order parameter which exhibits scaling at the critical point is generically missing in these systems. We here explore the possibility to use the Schmidt gap, which is an observable obtained from the entanglement spectrum, as an order parameter. A case study of the two-impurity Kondo model confirms that the Schmidt gap faithfully captures the scaling behavior by correctly predicting the critical exponent of the dynamically generated length scale at the critical point.