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Quantum Criticality on Graphs[1] ADRIAN DEL MAESTRO, University of Vermont, JAMES MURRAY, ZLATKO TESANOVIC, Johns Hopkins University — One of the tenets of our understanding of strongly correlated systems is that their macroscopic critical behavior is often universal and independent of any microscopic details. Continuous phase transitions driven by either thermal or quantum fluctuations can be placed in universality classes defined by the spatial dimension and the symmetry of a Landau-like order parameter. In an attempt to further understand the role of the spatial dimension in universality, we imagine a system whose symmetries and connectivities are controlled by the low-lying spectrum of degrees of freedom on a graph. As an elucidating example, we study a quantum phase transition on large random regular graphs, with coupled vertices described by d-dimensional O(N) quantum rotor models.

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