Order parameter statistics at a quantum phase transition
AUSTEN LAMACRAFT, University of Virginia, PAUL FENDLEY, University of Virginia and All Souls College, Oxford — Universality implies that at a second order phase transition the probability distribution of the order parameter takes a universal scaling form. This distribution is a natural way to characterize the quantum critical properties of ultracold atomic gases, since its histogram may be readily obtained by repeated ‘single-shot’ measurements. In this work we obtain the exact scaling probability distribution for the simplest quantum critical point: that of the transverse field Ising model in 1D. Using a novel identity for the Ising model correlation functions, we map the problem to a particular case of the anisotropic Kondo model.