

Scale Invariance and Quantum Criticality in Atomic Quantum Gases

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The collective behavior of a many-body system near a continuous phase transition is insensitive to the details of its microscopic physics. Characteristic features near the phase transition, called critical phenomena, are that the thermodynamic observables follow generalized scaling laws. We will discuss the observation of the quantum critical behavior in strongly correlated 2D Bose based on direct in situ optical imaging. Our observation points toward a growing density-density correlations in the critical regime and raises new perspectives to explore quantum critical dynamics.

INVITED PAPER