Contribution ID: **28** Type: **not specified**

Dynamic Criticality and Dissipation in Model A

Tuesday 24 September 2024 17:10 (30 minutes)

In this talk, I will explore the dissipation rate of a scalar field near the phase transition and within the ordered phase, focusing on systems that fall under the universality class of Model A. Our approach employs a dynamical field theory framework, where we perform a leading-order expansion of the effective action in terms of field gradients while retaining full field dependence. I will present the solution of functional renormalization group (fRG) equations to determine both the effective potential and the dissipation rate. Of particular interest are the static and dynamic critical behaviors, as well as the symmetry-broken phase. In the latter, we observe that the transport coefficient of the dissipative fluid equation acquires a barrier that grows exponentially with system volume. Additionally, I will outline the process of computing the ansatz for the effective action within the fRG formalism in real time, extending the analysis up to second-order field derivatives.

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Session Classification: Parallel A