

Introduction to non-equilibrium QFT, and the 2PI effective action

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With the developments of modern measurement techniques we are able to test Physics at a vast range of scales, ranging from collider experiments to single-atom detection. Apart from being Quantum Theories, the description of these systems also share that a clear understanding of the non-equilibrium dynamics is not fully established. Also missing is a clear understanding of how systems thermalize. In this talk I focus on one approach to formulate out-of-equilibrium QFT using the N-PI effective action, a natural extension of the 1PI effective action, within the Keldysh formalism. Explicitly considering the 2PI approach, I aim to present a general framework for understanding non-equilibrium dynamics, as well as motivate future research in this area across topics, as this framework finds applications across scales. Some of these applications, past and future, will be summarized at the end of my talk.

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