

Statistical and Biological Physics group seminar

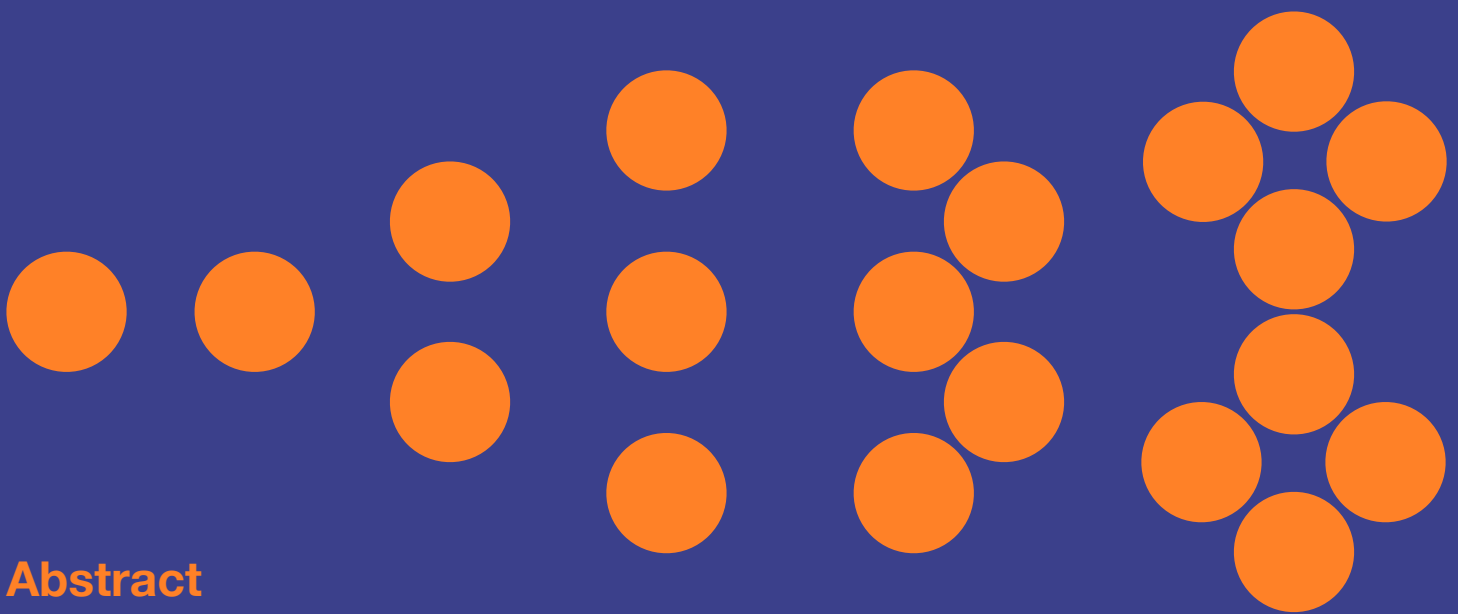
The Mpemba effect for phase transitions in Landau theory

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Room A213, Povo 1



Abstract

The Mpemba effect describes the situation in which a hot system cools faster than an identical copy initiated at a colder temperature. In many of the experimental observations of the effect, e.g., in water and clathrate hydrates, it is defined by the occurrence of the phase transition. However, so far, the theoretical investigations have yet to consider the timing of the phase transition, and most abstract models used to explore the Mpemba effect do not have a phase transition. In this talk, I will suggest a definition of phase transition time in a non-equilibrium state using the Landau theory for phase transitions. Using this definition, I will show that a Mpemba effect with respect to phase transitions can exist in such models, namely that the hotter system undergoes the transition before the colder one when quenched to a cold temperature.