ICTS | INTERNATIONAL CENTRE for THEORETICAL SCIENCES

TATA INSTITUTE OF FUNDAMENTAL RESEARCH

ICTS Statistical Physics Journal Club Seminar

Title : Quantized Bubble Nucleations

Speaker : Aritra Sinha (Jagiellonian University, Poland)

Date : Thursday, 05th August 2021

Time : 03:00 pm (IST)

Abstract : Non-equilibrium dynamics of slow quenches across continuous phase transitions have been understood very successfully under the unifying theory of the Kibble-Zurek mechanism. However, relatively less attention has been paid to understanding dynamics across first-order quantum phase transitions(FOQPT). In an attempt to mitigate this, here I will talk about the consequences of a slow dynamical ramp across the FOQPT transition line present in the Ising model with both transverse and longitudinal fields. The existence of a potential barrier, quintessential to the FOQPTs, gives rise to metastability in the dynamical state. We find that in the considered model, such metastability wear off by nucleating bubbles of the true ground state driven by quantum fluctuations. Specifically, we identify special resonant regions in the longitudinal field, where the metastable state can easily tunnel to nucleate bubbles of specific sizes (quantized). Further, I will describe our attempt to explain the entire non-adiabatic process under the umbrella of Landau-Zener theories.

Venue : Please click on the below link to join the seminar

https://us06web.zoom.us/j/82504043737?pwd=L3NDVFZXUC85QjFjN0FIRTdpVjdpZz09
Meeting ID: 825 0404 3737
Passcode: 407663