

Bubble wall dynamics at the electroweak phase transition

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The early Universe provides a unique environment for exploring fundamental physics, offering extreme conditions that enable testing of theoretical models. A broad range of cosmological phenomena could allow us to probe particle physics at energy scales far beyond the capabilities of current and future colliders.

Among these, first-order phase transitions play an important role, as they can leave distinct signatures. One such signature is a stochastic gravitational wave background, which could serve as a valuable tool for investigating physics beyond the Standard Model, particularly concerning the electroweak sector, complementing collider-based searches. The key features of cosmological relics depend on the dynamics of the bubbles that form during the phase transition, including their interactions with the surrounding plasma and the friction they experience.

This talk will focus on recent advances in the quantitative theoretical description of bubble dynamics, which allow for more precise determination of physical observables such as bubble velocities.

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