

# Supercooled phase transitions from radiative symmetry breaking. Phenomenology, renormalisation and naturalness.

*Tuesday, September 23, 2025 12:30 PM (30 minutes)*

Supercooled cosmological phase transitions typically yield a strong gravitational-wave background, potentially detectable, e.g. in LISA. The scenario of supercooling is naturally realised in models with classical scale invariance, where symmetry is broken radiatively. I will review the phenomenology of the supercooled phase transition and explain how to properly compute the bubble nucleation rate. One can wonder whether introducing mass scales through the on-shell renormalisation could break scale invariance and significantly alter phenomenological predictions of this class of models. In this talk, working with a simple model, I will explain how to renormalise classically scale-invariant models in the on-shell scheme. Understanding the correspondence between various mass scales will shed some light on the naturalness of classically scale-invariant scenarios.

**Primary authors:** ŚWIEŻEWSKA, Bogumiła (University of Warsaw); KIERKLA, Maciej (University of Warsaw)

**Co-author:** SÓJKA, Bartosz

**Presenter:** ŚWIEŻEWSKA, Bogumiła (University of Warsaw)

**Session Classification:** Plenary 6

**Track Classification:** Plenary