

## What the heck happens when the Universe boils?

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# Baryogenesis via relativistic bubble walls

*Tuesday, 6 December 2022 14:00 (1 hour)*

We present a novel mechanism which leads to the baryon asymmetry generation during the strong first order phase transition. If the bubble wall propagates with ultra-relativistic velocities, it has been shown that it can produce states much heavier than the scale of the transition and that those states are then out-of-equilibrium. In this paper, we show that the production mechanism can also induce CP-violation at one-loop level. We calculate those CP violating effects during the heavy particle production and show, that combined with baryon number violating interactions, those can lead to successful baryogenesis. Two models based on this mechanism are constructed and their phenomenology is discussed. Stochastic gravitational wave signals turn out to be generic signatures of this type of models.

**Presenter:** Dr MIGUEL VANVLASSELAER (SISSA)