

First-order phase transitions in the early Universe: gravitational waves, black holes, and feebly-interacting particles

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The possibility of first-order phase transition in the early Universe is drawing attention in view of gravitational wave observations planned for the 2030's. In this talk I will first report updates on Higgsless simulations for gravitational wave production, and then report (negative) results regarding primordial black hole formation from strong phase transitions. Then I will discuss possible characteristic imprints on the gravitational waves when feebly interacting particles are produced during first-order phase transitions.

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