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Gravitational waves from first-order phase transitions: Approaching reliable predictions

Friday 19 July 2024 17:30 (15 minutes)

The 2016 discovery of gravitational waves by the LIGO-Virgo collaboration is a watershed moment in cosmology. Now, with the approval of the space-based LISA experiment, the hunt is on: A search for gravitational-wave remnants of the Electroweak phase transition; to probe the Higgs potential and perchance even explain the Baryon asymmetry problem. Yet the theoretical hurdles are great—theoretical predictions can misjudge the peak gravitational-wave spectrum by even ten orders of magnitude. As such, naturally, there is a great push in the theoretical community to catch up to our experimental colleagues; to have theoretical predictions on solid ground as LISA looms.

In this talk I will illustrate the progress of using perturbation theory, together with Lattice simulations, to give robust predictions of the gravitational-wave spectrum from phase transitions. I will present the state-of-the-art of theoretical calculations and go into what challenges remain to be tackled.

Alternate track

1. Beyond the Standard Model

I read the instructions above

Yes

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