Advancing gravitational wave predictions from cosmological first-order phase transitions



Contribution ID: 5

Type: not specified

The complicated story of Primordial Black Holes production in cosmological Phase Transitions

In this talk, I will investigate the formation of Primordial Black Holes as the result of the collapse of energy density fluctuations originating from supercooled first-order phase transitions. I will present the results of a simplified approach, where the energy density fluctuations are evolved within the limit of flat FRW Universe. I will show how energy density fluctuations modify the Gravitational Wave signals as the production of secondary Gravitational Waves is induced. Finally, we will discuss the full covariant formalism of cosmological perturbation and show how it impacts the production of Primordial Black Holes and Gravitational Waves.

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