

Primordial black holes from strong first order phase transitions

This talk is aimed to analyze the possibility of Primordial Black Holes (PBHs) production during supercooled first order phase transitions in the Early Universe.

The transition proceeds through the nucleation of bubbles of the broken phase in an initial background of the symmetric phase, which later collide and percolate, finishing the conversion of the Universe, with their nucleation rate assumed to be given by generic action expanded to the quadratic order.

We focus on a scenario in which PBHs are produced purely by the collapse of overdense regions which remain long enough in the false vacuum state, where bubble nucleation is effectively postponed.

We present a description of such regions and determine the conditions of their gravitational collapse.

We find the final mass function and abundance of PBHs created in such manner to be highly dependent on the history of the transition and we identify the regions in parameter space for which PBHs' abundance matches that of Dark Matter inferred from observations.

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