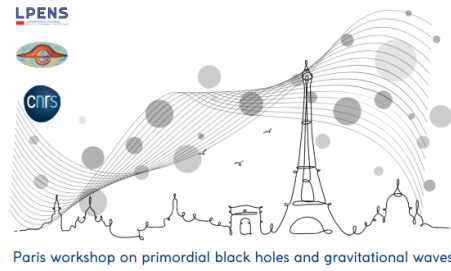


## Paris workshop on primordial black holes and gravitational waves



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# Imprint of PBH domination on gravitational waves generated by cosmic strings

*Tuesday, 28 November 2023 15:15 (20 minutes)*

We study the effect of an ultra-light primordial black hole (PBH) dominated phase on the gravitational wave (GW) spectrum generated by a cosmic string (CS) network formed as a result of a high-scale  $U(1)$  symmetry breaking. A PBH-dominated phase leads to tilts in the spectrum via entropy dilution and generates a new GW spectrum from PBH density fluctuations, detectable at ongoing and planned near-future GW detectors. The combined spectrum has a unique shape with a plateau, a sharp tilted peak over the plateau, and a characteristic fall-off, which can be distinguished from the one generated in the combination of CS and any other matter domination or new exotic physics. We discuss how ongoing and planned future experiments can probe such a unique spectrum for different values of  $U(1)$  breaking scale and PBH parameters such as initial mass and energy fraction.

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