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Searching for Primordial Black Holes from the QCD Epoch Using Gravitational Waves

Tuesday, 12 December 2023 10:00 (50 minutes)

Primordial Black Holes (PBHs) might comprise a significant fraction of dark matter in the Universe and can give rise to observable signatures in current and future gravitational wave (GW) experiments. Focusing on PBHs in the mass range probed by the LIGO/Virgo/Kagra detectors, I will present the results of Bayesian multi-population inference on the most recent dataset. The analysis includes a subpopulation of PBH mergers modeled from first principles, taking into account the softening of the equation of state during the QCD era. These findings allow for setting constraints on both the PBH abundance and the inflationary dynamics underlying PBH formation within the standard scenario. I will then discuss how future observations can improve upon these constraints by searching for specific signatures of PBH mergers.

Primary author: FRANCIOLINI, Gabriele (CERN)

Presenter: FRANCIOLINI, Gabriele (CERN)

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