

## Timing the cosmic expansion with populations of gravitational waves dark sirens

For over 20 years, measurements of the Universe expansion rate from close-by and far sources are in tension hinting at the presence of new physics. Gravitational Waves (GWs) from compact binary coalescences (CBCs) are emergent cosmological probes, potentially observable from close to far scales. GWs are Standard Sirens as they are the only source for which it is possible to measure the distance. In this talk, I will discuss how populations of dark sirens, namely GW sources observed without electromagnetic counterparts, can be exploited to measure cosmic expansion. I will mainly discuss two methodologies that can assign a redshift to GW events either using galaxy surveys or the source mass spectrum of binary black holes. I will show possible pitfalls of the two methodologies that could potentially introduce a systematic bias in the estimation of the Hubble constant. Finally, I will present the latest results on the measurement of the cosmic expansion rate from the dark sirens reported in the latest Gravitational Wave Transient catalogue.

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