

Abstract Submitted  
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**Probing the standard cosmological model with the population of binary black-holes**<sup>1</sup> JOSE MARIA EZQUIAGA, University of Chicago — Gravitational-wave (GW) detections are rapidly increasing in number, enabling precise statistical analyses of the population of compact binaries. In this talk I will show how these population analyses cannot only serve to constrain the astrophysical formation channels, but also to learn about cosmology. The three key observables are the number of events as a function of luminosity distance, the stochastic GW background of unresolved binaries and the location of any feature in the source mass distribution, such as the expected pair instability supernova (PISN) gap. Given data from LIGO-Virgo observations, I will present constraints in cosmological modifications of gravity. I will also discuss future prospects on measuring  $H_0$  given a possible population of black holes above the PISN gap. These novel tests of the standard cosmological model require GW data only and will become increasingly relevant as GW catalogs grow, specially if multi-messenger events remain elusive.

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