

Abstract Submitted  
for the APR20 Meeting of  
The American Physical Society

**Testing Dark Energy with Multi-Messenger Observations**

MACARENA LAGOS, University of Chicago — We still have a considerable lack of understanding about the constituents of our Universe and, in addition, tensions are starting to arise between datasets as we reach subpercent precision constraints. In this talk, I will mention how we can use standard sirens to probe possible physics beyond the concordance  $\Lambda$ CDM model. In particular, I will show how the presence of a dynamical dark energy component can induce a time-evolving gravitational coupling, which modifies the propagation of gravitational waves, and can thus be tested with observations of compact binary mergers. I will also discuss how dynamical dark energy can bias independent constraints on the current Hubble rate set with future LIGO detections. Finally, I will clarify the role that other constraints on time-evolving gravitational couplings —such as from Lunar Laser Ranging and Binary Pulsars— play on the outlook of using standard sirens for testing dark energy.

Macarena Lagos  
University of Chicago

Date submitted: 09 Jan 2020

Electronic form version 1.4