

Abstract Submitted
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Testing general relativity with black-hole binary observations: results and prospects MICHELE VALLISNERI, Caltech/Jet Propulsion Laboratory — The first two LIGO-Virgo detections of gravitational waves from binary black-hole inspirals offered the first opportunity to test gravitation in its strong-field, relativistic-motion, and radiative sector. The initial tests reported in PRL 116 (2016) probed consistency with the predictions of general relativity, to moderate precision. The space-based observatory LISA will observe black-hole binary signals with much larger SNRs, allowing for even more precise tests. Last, the detection of a binary black-hole stochastic background with pulsar-timing arrays will offer more constraints on the speed and polarizations of gravitational waves. I review these results and examine synergies across the gravitational-wave spectrum. I discuss the main challenges and opportunities from the viewpoint of data analysis, and outline prospects for making contact with current alternative theories of gravitation, in particular those motivated by models of dark energy.

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