

Tests of general relativity through the direct detection of gravitational waves

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The detection by LIGO and Virgo of gravitational waves from compact binary coalescences has given us access to the genuinely strong-field, dynamical regime of gravity, enabling tests of general relativity in the fully nonlinear domain. Moreover, the nature of gravitational waves can be tested by looking at the way they propagate over large distances. As the sensitivity of the detectors improves, it will soon also be possible to probe the nature of compact objects themselves. In the case of presumed black holes, are they really the Kerr black holes of general relativity, or even more exotic objects? Thus, key questions about gravity - possibly including quantum gravity - can finally be addressed through direct observation.

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