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Testing general relativity: Centenary highlights and future prospects

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During the latter part of the 20th century, general relativity was well-tested in the weak-field slow-motion regime of the solar system. In binary pulsar systems, some tests of strong-field aspects of the theory were carried out. We will give a brief overview of these achievements. As we look to the post-centenary future, testing GR in the strong-field, highly dynamical regime will be an important theme in experimental relativity. We will describe a number of possible tests that could be carried out, including tests using astrophysical phenomena around black holes, tests using gravitational waves, and tests of black hole no-hair theorems using high-precision observations of stars orbiting our galactic center black hole.