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Tests of GR Using Neutron Star - White Dwarf Binaries

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Binary radio pulsars, and in particular the double neutron star (NS) systems, provide famous tests of general relativity due to their relatively compact orbits and the precision with which we can measure them via pulsar timing. Neutron star - white dwarf (WD) systems, though, allow qualitatively different tests of GR due to the several orders-of-magnitude difference in the self-gravities of their compact objects. Compact NS-WD systems, like PSR J1141-6545 and the recently discovered J0348+0432, with a high-mass NS, can test the radiative properties of gravity, such as the possibility of dipolar gravitational wave emission. NS-WD systems in wide circular orbits have been used to test the strong equivalence principle (SEP) by looking for a "polarization" of their orbits via the Nordtvedt effect. Recently, a millisecond pulsar in a triple system, J0337+1715, was discovered which promises much stronger tests of the SEP in the near future. Finally, ongoing pulsar surveys by all the World's major single-dish radio telescopes will continue to provide exotic (and surprising!) systems for us to monitor.