

Testing strong-field gravity with multimessenger observations of neutron stars

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Neutron stars are some of the most extreme objects in Nature. Their typical masses (around 1.4 times that of the Sun) combined with their small radii (about 12 km) result in densities exceeding the nuclear saturation density, above which exotic states of matter can form. Moreover, neutron stars are among the strongest gravitational field sources known, second only to black holes. These properties make neutron stars exceptional laboratories to study matter and gravity in extreme situations, out of reach of terrestrial and Solar System experiments. I will discuss how neutron star observations, both with the x-ray Neutron Star Interior Composition Explorer (NICER) mission and with gravitational-wave observatories (LIGO-Virgo-Kagra), offer us new avenues to test general relativity and constrain modifications thereof.

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