

Consequences of neutron star mergers for constraining the equation of state of nuclear matter

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I will discuss the rapid recent progress made in modelling neutron stars in binary system and show how the inspiral and merger of these systems is more than a strong source of gravitational waves. Indeed, while the gravitational signal can provide tight constraints on the equation of state for matter at nuclear densities, the formation of a black-hole–torus system can explain much of the phenomenology of short gamma-ray bursts, while the ejection of matter during the merger can shed light on the chemical enrichment of the universe. Finally, I will review how our understanding on the maximum mass and radii of neutron stars has improved with the detection of GW170817.

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