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Binary neutron star mergers: Observations and modelling in multimessenger astronomy era

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Compact binary mergers are cosmic laboratory for fundamental physics. All four fundamental interactions play a key role in setting the properties of the observables associated with these powerful stellar collisions. Thus, they need to be taken into account to provide reliable multimessenger predictions. In this talk, I will present the results obtained by the Ligo-Virgo collaborations for the first multimessenger detection of a binary neutron star merger event, GW170817. These results will be discussed in the context of the most recent theoretical models concerning the properties of the GW emission, of the matter ejection and of the related electromagnetic counterpart (kilonova), based on a large series of detailed numerical models. In particular, the role of weak interaction in shaping the nucleosynthesis and the electromagnetic counterpart is discussed.

Content of the contribution

Theory

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