

## Binary neutron star mergers as multimessenger sources: population prospects and applications

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The binary neutron star merger GW170817 was a gravitational-wave event rich with electromagnetic counterparts: a short gamma-ray burst, a kilonova, afterglow radiation from the relativistic outflow and—if further data confirms—afterglow radiation from the slowly expanding nebula. However, this richness is due to the proximity and favorable inclination of this historic event. During upcoming gravitational-wave observing runs, which electromagnetic counterparts should we expect to observe? We will focus on the kilonova and the relativistic afterglow and rely on state-of-the-art modelling for the emission and detection of these signals. For various gravitational-wave and electromagnetic follow-up instrument sensitivities, we will predict detection rates and brush a portrait of the multimessenger population to come: distances, inclination angles, magnitudes and afterglow flux levels, etc. Finally, we will present the insight that this population model provides on the viability of using these counterparts for multimessenger cosmology, and how it allows to constrain the sources detected during the latest O3 run of the Ligo-Virgo-Kagra network.

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