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Simulating and Interpreting the Multimessenger Picture of Neutron Star Mergers

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The correct interpretation of multimessenger data obtained from binary neutron star mergers, including gravitational waves and electromagnetic signals, requires accurate theoretical predictions that can be cross-correlated with observations. These models can be constructed by combining ab initio numerical-relativity simulations with derived analytical knowledge. In addition, an efficient Bayesian framework for multimessenger analysis is indispensable for extracting meaningful information from observational data. We will discuss how numerical-relativity simulations and multimessenger data analysis go hand in hand to provide valuable insights into neutron star mergers and fundamental physics principles.

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