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Linking microphysics and cosmology through next-generation detections of neutron-star mergers

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Evaluating joint models for the electromagnetic and gravitational signals received from the 2017 neutron-star merger has proven both challenging and insightful. By incorporating further model assumptions or different data sources, we can obtain even tighter constraints on related fields. In particular, such mergers offer a natural connection to both nuclear properties through the dense-matter equation of state and cosmological parameters through independent measurements of distance and redshift. Moreover, next-generation detectors will drastically increase the amount and quality of detected signals. Consequently, statistically robust statements will become computationally more demanding as we expand our modelling and analysis scope. I will discuss how recent extensions to the multimessenger analysis package NMMA allow the incorporation of new data across sectors for tighter multimessenger constraints at acceptable computational cost in a Bayesian framework.

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