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Probing nuclear physics with gravitational waves

The gravitational waves from merging binary systems carry unique information about the nature and internal structure of compact objects. This is of key interest for neutron stars, whose material is compressed by strong gravity to supra-nuclear densities, leading to unique states of matter. I will describe examples of resulting gravitational-wave signatures and associated characteristic parameters, and their link to properties of dense matter. I will also highlight insights gained from recent gravitational-wave discoveries, and conclude with an outlook onto the remaining challenges and exciting prospects for the next years, as gravitational-wave science continues to move towards an era of precision physics.

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