Deformations of neutron stars with elastic crusts

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With the recent, first detection of a binary neutron star merger by gravitational-wave detectors it proves timely to consider how the internal structure of neutron stars affects the way in which they are deformed. Such deformations will leave measurable imprints on gravitational-wave signals and can be sourced through tidal interactions or the formation of mountains. In this talk, I will summarise the formalism that describes fully-relativistic neutron star models with elastic crusts undergoing static perturbations. This formalism primes the problem for studies into a variety of different mechanisms that can deform a neutron star. I will present results from integrating the perturbation equations for tidally-deformed neutron stars with simple barotropic equations of state, which can be used to calculate the tidal Love number.

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