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Tidal interactions in binary inspirals

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One of the most exciting prospects of gravitational-wave astronomy is to measure the tidal deformability of neutron stars and convert these measurements into constraints on the equation of state of nuclear matter at very high densities. I describe the ongoing effort by many researchers to model the tidal interactions between compact bodies in binary inspirals, which involves the strong self-gravity of each body and the weak mutual gravity of the binary system. The interaction includes the regime of dynamical tides, in which the external, orbital timescale becomes comparable to each body's internal, hydrodynamical timescale. I conclude with a discussion of black holes and their vanishing Love numbers.

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