

Binary black hole mergers beyond general relativity

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At some length scale, Einstein's theory of general relativity (GR) must break down and be reconciled with quantum mechanics in a quantum theory of gravity. Binary black hole mergers probe the strong field, non-linear, highly dynamical regime of gravity, and thus gravitational waves from these systems could contain beyond-GR signatures. While LIGO presently performs model-independent and parametrized tests of GR, in order to perform model-dependent tests, we must have access to numerical relativity binary black hole waveform predictions in beyond-GR theories through full inspiral, merger, and ringdown. In this talk, I will discuss our results in producing full numerical relativity waveforms in beyond-GR theories, including dynamical Chern-Simons gravity and Einstein dilaton Gauss-Bonnet gravity.