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Black Holes and the Entangling Structure of Spacetime

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I describe results that show how black holes affect the entanglement of qubits. Making use of an approach called entanglement harvesting, which is an operational way to transfer correlations from the quantum vacuum to (idealized) detectors, I show how quantum correlations are affected by the structure of spacetime. This becomes particularly interesting when the spacetime has curvature, and even more so if a black hole is present. A variety of new phenomena occur, including asymmetric time-shift effects, forbidden entanglement islands in parameter space, entanglement inhibition near event horizons, and sensitivity to topology. I shall provide an overview of an ongoing research program in this area along with a description of these and other novel results.

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