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The Black Hole Information Paradox: A Resolution on the Horizon?[1]

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The black hole information paradox – whether information escapes an evaporating black hole or not – remains one of the greatest unsolved mysteries of theoretical physics. The apparent conflict between validity of semiclassical gravity at low curvatures and unitarity of quantum mechanics has long been expected to find its resolution in the deep quantum gravity regime. Recent developments in the holographic dictionary and in particular its application to entanglement, however, have shown that a semiclassical analysis of gravitational physics has a hallmark feature of unitary evolution. I will describe this recent progress and discuss some potential new avenues for working towards a resolution of the information paradox.

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