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Quantum black holes at world's end

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Semi-classical gravity is a useful proxy to study quantum effects in gravity. Yet, generically, consistent solutions to the semi-classical Einstein equations accounting backreaction remain out of reach, limiting our understanding of quantum corrections to black hole physics. In this talk, I review the construction of three-dimensional 'quantum' black holes. Such spacetimes live on holographic end-of-the-world branes and are exact solutions to an induced higher-derivative theory of gravity consistently coupled to a large-c conformal field theory with an ultraviolet cutoff, accounting for all orders of semi-classical backreaction. Notably, such quantum-corrected black holes are much larger than the Planck length and are thereby robust against quantum gravitational effects. I describe the geometry and thermodynamics of a host of (anti-) de Sitter quantum black holes, and survey applications of these constructions.

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