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The entropy of non-smooth black holes

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In general relativity, dynamical black holes generically have non-smooth horizons. One can study the properties of the non-smooth structures that are stable under perturbations of the horizon. This analysis does not make use of the Einstein equations, and hence is potentially relevant to higher-derivative theories of gravity. We describe the possible non-smooth structures and discuss some implications for the entropy of a black hole. In particular, we speculate whether creases (structures where two generators enter the horizon) could contribute to the entropy, and argue that the Gauss-Bonnet term is non-topological for non-smooth horizons. This talk is based on work done with Harvey Reall.

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