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A singularity theorem for evaporating black holes

The classical singularity theorems of General Relativity rely on energy conditions that are easily violated by quantum fields. In this talk I will provide motivation for an energy condition obeyed by semiclassical gravity: the smeared null energy condition (SNEC), a proposed bound on the weighted average of the null energy along a finite portion of a null geodesic. I will then present the proof of a semiclassical singularity theorem using SNEC as an assumption. This theorem extends the Penrose theorem to semiclassical gravity and has interesting applications to evaporating black holes. Based on: [arXiv:2012.11569](https://arxiv.org/abs/2012.11569)

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