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Spacetime thermodynamics and Weyl rescaling

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A lot can be learned about spacetime by rescaling it à la Weyl. The familiar analogy between the laws of black hole mechanics and thermodynamics becomes ambiguous under such a rescaling. The deep reason for such an issue goes back to the fundamental dichotomy between matter and geometry inherent in Einstein equations. This dichotomy is actually so fundamental that the issue extends beyond black hole thermodynamics, affecting the more general theme of spacetime thermodynamics.

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