The contingent law: A tale of Maxwell's Demon

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Abstract

In my master's thesis for physics and philosophy, I take a long and hard look at the debates surrounding Maxwell's Demon and the status of the second law of thermodynamics. I try to clarify the use of Maxwell's thought experiment in understanding the second law; to prove that the second law is contingent, given only classical mechanics and time asymmetry; to argue that the law only holds because of facts about the kinds of particles that exist in our universe; to show that and why the attempts to banish the demon using fluctuations, measurements or information or erasure have been unsuccessful; and I conclude that Maxwell's Demon is alive and kicking.

Keywords:	Maxwell's Demon; second law of thermodynamics; entropy; information
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