Justification in Statistical Mechanics

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Abstract

According to a standard view of the second law of thermodynamics, our belief in the second law can be justified by pointing out that low entropy macrostates are less probable than high entropy macrostates, and then noting that a system in an improbable state will tend to evolve toward a more probable state. I would like to argue that this justification of the second law of thermodynamics is fundamentally flawed, and will show that some puzzles sometimes associated with the second law are merely artifacts of this incorrect justification.

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