

Abstract:

In this presentation we briefly discuss the history of James Clerk Maxwell, in which we mention some of his contributions to science. We then discuss Maxwell's thought experiment, known as Maxwell's Demon, in which an intelligent demon acts as a gatekeeper between two thermodynamic systems of particles and causes the system to lose thermal equilibrium thus causing a seeming inconsistency with the second law of thermodynamics. We offer an explanation why Maxwell's model isn't really inconsistent as the demon has to expend energy to sort the particles and thus balance out the entropy. We also discuss some contemporary ideas that are inspired by and related to Maxwell's Demon, more specifically a molecular information ratchet in which contemporary scientist David Leigh and associates create a sort of molecular system reminiscent of Maxwell's Demon.

References:

- Maxwell's Demon 2: Entropy, Classical and Quantum Information, Computing By Harvey S. Leff, Andrew F. Rex
- Exercising Demons: A Molecular Information Ratchet Viviana Serreli, Chin-Fa Lee, Euan R. Kay and David A. Leigh, Nature 445, 523-527 (2007).
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- <http://en.wikipedia.org/wiki/Rotaxane>
- http://en.wikipedia.org/wiki/Maxwell's_demon