

# **Microscopic contributions to the entropy production: from nonequilibrium steady states to global equilibrium**

*Monday, 6 February 2023 12:00 (25 minutes)*

Entropy production was originally a phenomenological concept and quantifies irreversibility by accounting for all changes in entropy, which is positive by virtue of the second law of thermodynamics. Afterwards, entropy production was derived microscopically, and its derivations date back to Boltzmann, von Neumann, and others. Nowadays, small open quantum systems far from equilibrium have been attracting attention, and entropy productions in nonequilibrium systems have been discussed. Recently, entropy production has been reexpressed in terms of precise information theoretic quantities and computed in a microscopic model. Following this previous work, we study the relative importance of these quantities. We go beyond it by looking at the long-time regime, where finite size effects are important, and by using a slightly different splitting. Our findings could be useful to optimize nanoscale heat engines by identifying the main contributions to entropy production, and give insights into the fundamental nature of entropy production.

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