

# Is There a Thermodynamics of Nonequilibrium Steady States?

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## Introduction

Over the past 20 years, researchers have tried to construct a macroscopic theory of nonequilibrium steady states (NESS) analogous to equilibrium thermodynamics. I shall describe an approach based on the definition of intensive parameters such as temperature and chemical potential for NESS via coexistence with reservoirs [1]. This program has enjoyed some success in predicting the properties of initially isolated systems when brought into contact. Nevertheless, consistent treatment of nonuniform systems, including coexisting phases, appears to be beyond the scope of the theory [2,3]. This talk will review these issues, as well as questions about a nonequilibrium entropy function, and reservoir equivalence, in the context of stochastic lattice models [4]. Our results suggest that the thermodynamics of NESS is far more limited than that of equilibrium systems.

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Include acknowledgments before references.

## References

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