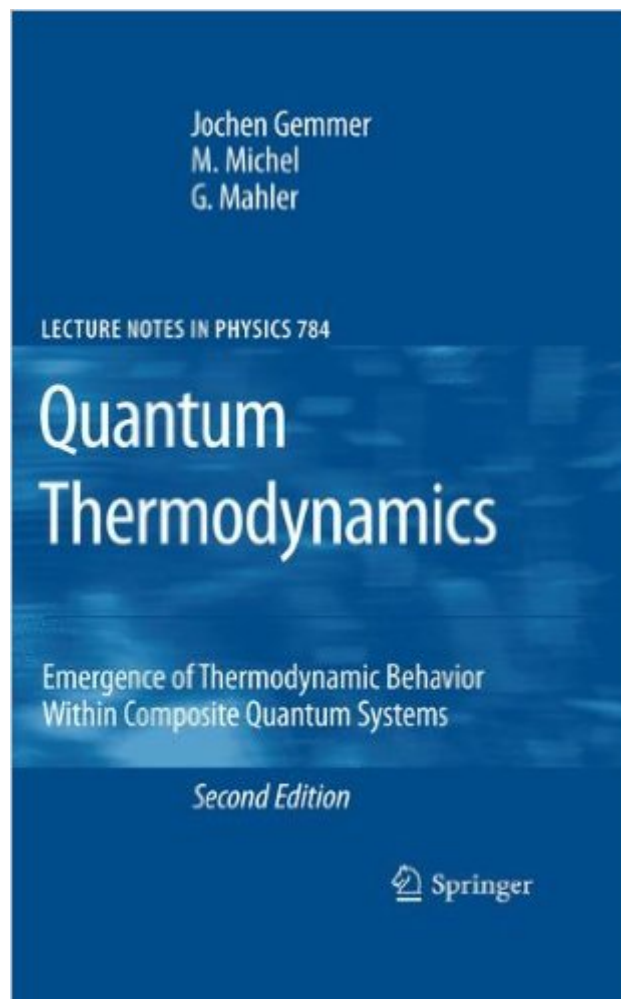


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# Quantum Thermodynamics: Emergence Of Thermodynamic Behavior Within Composite Quantum Systems (Lecture Notes In Physics)



## Synopsis

Over the years enormous effort was invested in proving ergodicity, but for a number of reasons, confidence in the fruitfulness of this approach has waned. • Y. Ben-Menahem and I. Pitowsky [1]

**Abstract** The basic motivation behind the present text is threefold: To give a new explanation for the emergence of thermodynamics, to investigate the interplay between quantum mechanics and thermodynamics, and to explore possible extensions of the common validity range of thermodynamics. Originally, thermodynamics has been a purely phenomenological science. Early scientists (Galileo, Santorio, Celsius, Fahrenheit) tried to give definitions for quantities which were intuitively obvious to the observer, like pressure or temperature, and studied their interconnections. The idea that these phenomena might be linked to other fields of physics, like classical mechanics, e.g., was not common in those days. Such a connection was basically introduced when Joule calculated the heat equivalent in 1840 showing that heat was a form of energy, just like kinetic or potential energy in the theory of mechanics. At the end of the 19th century, when the atomic theory became popular, researchers began to think of a gas as a huge amount of bouncing balls inside a box.

## Book Information

Series: Lecture Notes in Physics (Book 784)

Hardcover: 346 pages

Publisher: Springer; 2nd ed. 2010 edition (October 27, 2009)

Language: English

ISBN-10: 3540705090

ISBN-13: 978-3540705093

Product Dimensions: 6.2 x 0.9 x 9.2 inches

Shipping Weight: 1.6 pounds

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Best Sellers Rank: #3,407,299 in Books (See Top 100 in Books) #82 in Books > Science & Math

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