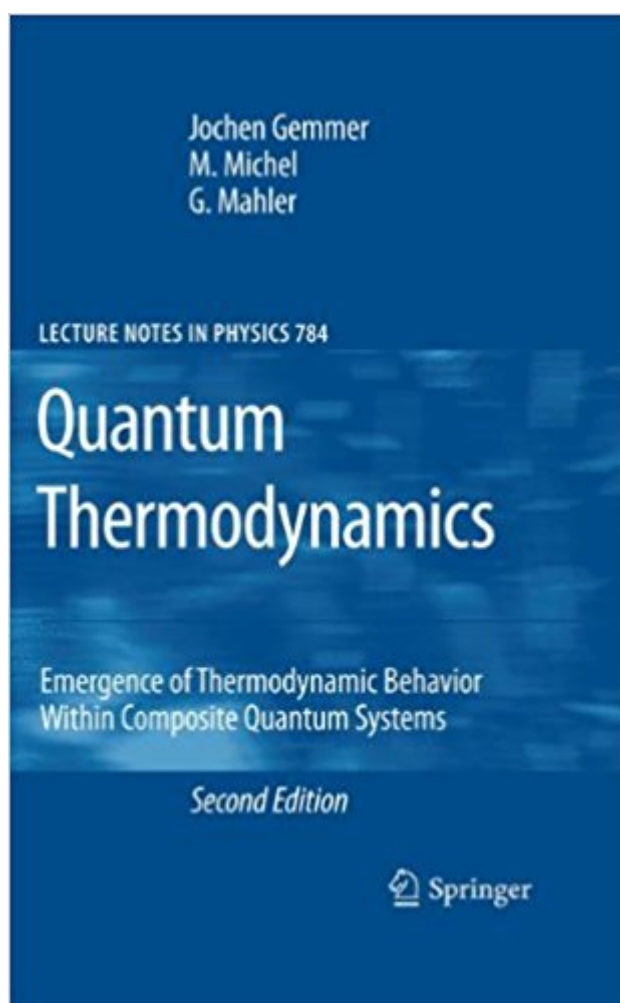


The book was found

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 (View shipping rates and policies)

Average Customer Review: Be the first to review this item

Best Sellers Rank: #3,572,820 in Books (See Top 100 in Books) #89 in Books > Science &

Math > Physics > Entropy #1368 in Books > Science & Math > Physics > Dynamics >

Thermodynamics #2672 in Books > Science & Math > Physics > Mathematical Physics

Customer Reviews

From the reviews of the second edition: — “The aim of this textbook is to show how thermodynamic behavior can emerge for a given finite quantum system. — | The book is written in a conceptually simple language, the focus being rather on the careful interpretation of the

concepts at hand and their illustrations on model systems. $\hat{H}$ presents some applications to model systems, which allows one to illustrate more precisely previously introduced notions. $\hat{H}$ (Gabriel Stoltz, Mathematical Reviews, Issue 2011 f) $\hat{H}$ “This book introduces into the emergent field of the application of thermodynamics to describe phenomena arising with open quantum systems which consist in one or few particles. $\hat{H}$ A clue of this book is that ergodicity or mixing are replaced by a kind of typicality which is introduced and used as a basic concept to define equilibrium. $\hat{H}$ This is a heuristic approach and the results derived show how it works well. $\hat{H}$ (K.-E. Hellwig, Zentralblatt MATH, Vol. 1221, 2011)

This introductory text treats thermodynamics as an incomplete description of quantum systems with many degrees of freedom. Its main goal is to show that the approach to equilibrium $\hat{H}$ with equilibrium characterized by maximum ignorance about the open system of interest $\hat{H}$ neither requires that many particles nor is the precise way of partitioning, relevant for the salient features of equilibrium and equilibration. Furthermore, the text depicts that it is indeed quantum effects that are at work in bringing about thermodynamic behavior of modest-sized open systems, thus making Von Neumann $\hat{H}$ ’s concept of entropy appear much more widely useful than sometimes feared, far beyond truly macroscopic systems in equilibrium. This significantly revised and expanded second edition pays more attention to the growing number of applications, especially non-equilibrium phenomena and thermodynamic processes of the nano-domain. In addition, to improve readability and reduce unneeded technical details, a large portion of this book has been thoroughly rewritten. $\hat{H}$ $\hat{H}$ From the reviews of the first edition: This textbook provides a comprehensive approach, from a theoretical physics point of view, to the question of emergence of thermodynamic behavior in quantum systems... [Its] strength lies in the careful development of the relevant concepts, in particular the question how large a system needs to be to exhibit thermodynamic behavior is addressed. Luc Rey-Bellet (Amherst, MA), Mathematical Reviews 2007e

[Download to continue reading...](#)

Quantum Thermodynamics: Emergence of Thermodynamic Behavior Within Composite Quantum Systems (Lecture Notes in Physics) Time’s Arrow: The Origins of Thermodynamic Behavior (Dover Books on Physics) Composite Construction for Homebuilt Aircraft: The Basic Handbook of Composite Aircraft Aerodynamics, Construction, Maintenance and Repair Plus, How-To and Design Information Damage Mechanics of Composite Materials, Volume 9 (Composite Materials Series) Statistical Methods for Data Analysis in Particle Physics (Lecture Notes in Physics) Physics from Symmetry (Undergraduate Lecture Notes in Physics) Principles of Physics: For Scientists and

Engineers (Undergraduate Lecture Notes in Physics) Principles of Astrophysics: Using Gravity and Stellar Physics to Explore the Cosmos (Undergraduate Lecture Notes in Physics) A Student's Guide Through the Great Physics Texts: Volume III: Electricity, Magnetism and Light: 3 (Undergraduate Lecture Notes in Physics) Conductors, Semiconductors, Superconductors: An Introduction to Solid State Physics (Undergraduate Lecture Notes in Physics) Recent Advances in the Theory of Chemical and Physical Systems: Proceedings of the 9th European Workshop on Quantum Systems in Chemistry and Physics ... in Theoretical Chemistry and Physics) Landau Theory Of Phase Transitions, The: Application To Structural, Incommensurate, Magnetic And Liquid Crystal Systems (World Scientific Lecture Notes in Physics) Advanced Molecular Quantum Mechanics: An Introduction to Relativistic Quantum Mechanics and the Quantum Theory of Radiation (Studies in Chemical Physics) Architecture and Systems Ecology: Thermodynamic Principles of Environmental Building Design, in three parts Ultracold Gases and Quantum Information: Lecture Notes of the Les Houches Summer School in Singapore: Volume 91, July 2009 Molecular Quantum Similarity in QSAR and Drug Design (Lecture Notes in Chemistry) Quantum Electrodynamics: Gribov Lectures on Theoretical Physics (Cambridge Monographs on Particle Physics, Nuclear Physics and Cosmology) Telescopes and Techniques (Undergraduate Lecture Notes in Physics) Calabi-Yau Varieties: Arithmetic, Geometry and Physics: Lecture Notes on Concentrated Graduate Courses (Fields Institute Monographs) Symmetry, Group Theory, and the Physical Properties of Crystals (Lecture Notes in Physics)

[Contact Us](#)

[DMCA](#)

[Privacy](#)

[FAQ & Help](#)