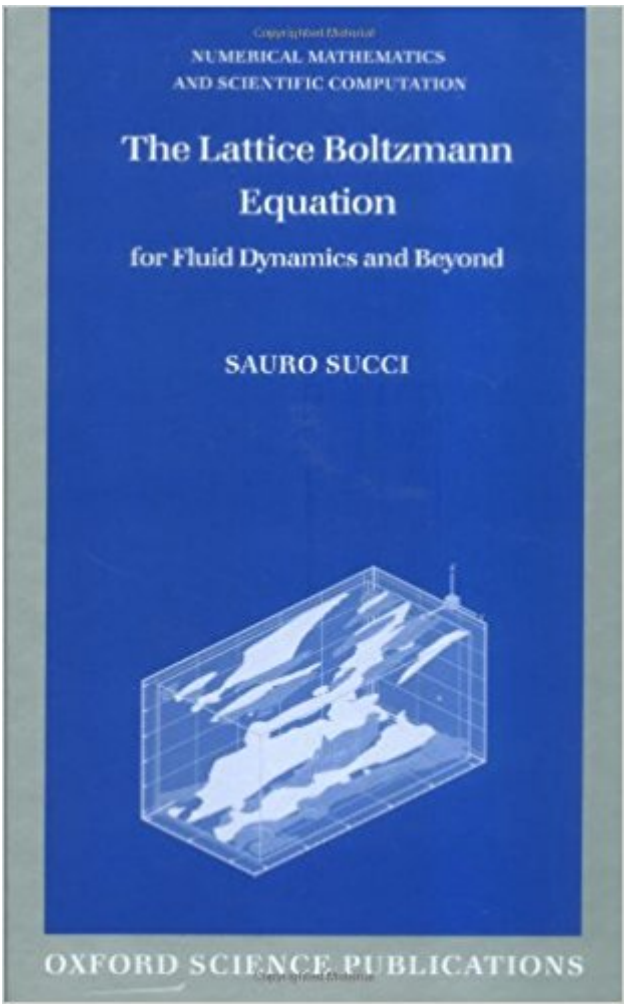
The Lattice Boltzmann Equation For Fluid Dynamics And Beyond (Numerical Mathematics And Scientific Computation)



Synopsis

In recent years, certain forms of the Boltzmann equation--now going by the name of "Lattice Boltzmann equation" (LBE)--have emerged which relinquish most mathematical complexities of the true Boltzmann equation without sacrificing physical fidelity in the description of complex fluid motion. This book provides the first detailed survey of LBE theory and its major applications to date. Accessible to a broad audience of scientists dealing with complex system dynamics, the book also portrays future developments in allied areas of science where fluid motion plays a distinguished role.

Book Information

Series: Numerical Mathematics and Scientific Computation

Hardcover: 304 pages

Publisher: Clarendon Press; 1 edition (August 30, 2001)

Language: English

ISBN-10: 0198503989

ISBN-13: 978-0198503989

Product Dimensions: 6 x 0.9 x 9 inches

Shipping Weight: 1.3 pounds (View shipping rates and policies)

Average Customer Review: 4.3 out of 5 stars 3 customer reviews

Best Sellers Rank: #2,992,595 in Books (See Top 100 in Books) #84 inÂ Books > Engineering & Transportation > Engineering > Aerospace > Gas Dynamics #1130 inÂ Books > Science & Math > Physics > Solid-State Physics #1671 inÂ Books > Science & Math > Physics > Mechanics

Customer Reviews

"[A]ddressed to a broad audience of scientists interested in the fluid dynamics of complex systems. The book also looks for future developments in related areas ... where the fluid motion plays an important role."--Zentralblatt MATH"The entire book is remarkable because of the pleasant and clear writing style, by which the author also conveys his excitement for the subject. Throughout, the reader is guided through the material by explicit explanations of purpose and goal of the presentation. ... The book contains 15 chapters that are organized into three well-balanced and distinct parts ... [a] well thought-out text ..."--Mathematical Reviews"[P]rovides a flavor of the possible and the exciting. This is a book for the enthusiast that reminds the expert how much fun he can have investigating the physics and applications of this rich field."--Physics Today

Sauro Succi is at Institute for Computing Applications, Rome.

This was for work of course.

This is essentially the first book fully dedicated to the lattice Boltzmann method (LB). The author did a great job in providing the necessary history of lattice Boltzmann, from Lattice Gas Cellular Automaton, its subsequent development, and deployments to multiphase, supersonic, microfluidics, etc flows.The unexperienced reader will find the first chapters very useful, as they lay the grounds for the rest of the book. The "derivation" of LB is especially relevant and full of insight. Very novice readers will certainly have to read the first chapters a few times to really grasp what LB is about (just because the concepts are seemingly simple but not straight forward in reality). The author, to this aim, provides all the tools necessary for a basic understanding of the underlying process (mostly the fields of statistical physics and cellular automaton).The experienced reader will find this book to be a good reference to LB. The latest reference to date (Aug 20008) is the book by Sukop and Thorne (Lattice Boltzmann Modeling: An Introduction for Geoscientists and Engineers) that provides more recent developments in the LB field.

The LBM methods are widely reviewed in all their relevant aspects.The only lacking of this book is the poor description of the mathematical/physical background needed by non-specialists for a complete undertanding of the book’s topics (e.g. the link between statistical mechanics and fluid dynamics).

Patterns, Proofs, and the Search for the Ultimate Equation (TED Books) Structural Dynamics: Theory and Computation Cloud Computing for Science and Engineering (Scientific and Engineering Computation) Introduction to Linear Optimization (Athena Scientific Series in Optimization and Neural Computation, 6) Fluid, Electrolyte, and Acid-Base Disorders in Small Animal Practice, 4e (Fluid Therapy In Small Animal Practice) The Amateur's Practical Guide to Fretwork, Wood Carving, Inlaying, Mitreing Picture Frames, Lattice and Verandah Work, Staining, Varnishing, ... Numerous Illustrations of Tools and Designs The New Book of Chinese Lattice Designs (Dover Pictorial Archives) Lattice Models of Polymers (Cambridge Lecture Notes in Physics) The Crystal Lattice: Phonons, Solitons, Dislocations, Superlattices