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Titolo	Lattice-Gas Cellular Automata and Lattice Boltzmann Models [[electronic resource]] : An Introduction / / by Dieter A. Wolf-Gladrow
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Nota di contenuto	From the contents: Introduction: Preface; Overview -- The basic idea of lattice-gas cellular automata and lattice Boltzmann models. Cellular Automata: What are cellular automata?- A short history of cellular automata -- One-dimensional cellular automata -- Two-dimensional cellular automata -- Lattice-gas cellular automata: The HPP lattice-gas

cellular automata -- The FHP lattice-gas cellular automata -- Lattice tensors and isotropy in the macroscopic limit -- Desperately seeking a lattice for simulations in three dimensions -- 5 FCHC -- The pair interaction (PI) lattice-gas cellular automata -- Multi-speed and thermal lattice-gas cellular automata -- Zanetti (staggered) invariants -- Lattice-gas cellular automata: What else? Some statistical mechanics: The Boltzmann equation -- Chapman-Enskog: From Boltzmann to Navier-Stokes -- The maximum entropy principle. Lattice Boltzmann Models: .... Appendix.

Sommario/riassunto

Lattice-gas cellular automata (LGCA) and lattice Boltzmann models (LBM) are relatively new and promising methods for the numerical solution of nonlinear partial differential equations. The book provides an introduction for graduate students and researchers. Working knowledge of calculus is required and experience in PDEs and fluid dynamics is recommended. Some peculiarities of cellular automata are outlined in Chapter 2. The properties of various LGCA and special coding techniques are discussed in Chapter 3. Concepts from statistical mechanics (Chapter 4) provide the necessary theoretical background for LGCA and LBM. The properties of lattice Boltzmann models and a method for their construction are presented in Chapter 5.