1. Record Nr. UNINA9910841686603321

Autore	Lappa Marcello
Titolo	Thermal convection [[electronic resource]] : patterns, evolution, and stability (historical background and current status) / / Marcello Lappa
Pubbl/distr/stampa	Hoboken, N.J., : Wiley, 2009
ISBN	1-282-37960-7 9786612379604 0-470-74998-9 0-470-74999-7
Descrizione fisica	1 online resource (692 p.)
Disciplina	541.36 620.11296
Soggetti	Thermal conductivity Density currents Viscous flow Fluid dynamics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Thermal Convection; Contents; Preface; Acknowledgements; 1 Equations, General Concepts and Methods of Analysis; 1.1 Pattern Formation and Nonlinear Dynamics; 1.1.1 Some Fundamental Concepts: Pattern, Interrelation and Scale; 1.1.2 PDEs, Symmetry and Nonequilibrium Phenomena; 1.2 The Navier-Stokes Equations; 1.2.1 A Satisfying Microscopic Derivation of the Balance Equations; 1.2.2 A Statistical Mechanical Theory of Transport Processes; 1.2.3 The Continuity Equation; 1.2.4 The Momentum Equation; 1.2.5 The Total Energy Equation; 1.2.6 The Budget of Internal Energy; 1.2.7 Newtonian Fluids 1.2.8 Some Considerations About the Dynamics of Vorticity1.2.9 Incompressible Formulation of the Balance Equations; 1.2.10 Nondimensional Form of the Equations for Thermal Problems; 1.3 Energy Equality and Dissipative Structures; 1.4 Flow Stability, Bifurcations and Transition to Chaos; 1.5 Linear Stability Analysis: Principles and Methods; 1.5.1 Conditional Stability and Infinitesimal

Sommario/riassunto

Thermal Convection - Patterns, Stages of Evolution and Stability Behavior provides the reader with an ensemble picture of the subject, illustrating the state-of-the-art and providing the researchers from universities and industry with a basis on which they are able to estimate the possible impact of a variety of parameters. Unlike earlier books on the subject, the heavy mathematical background underlying and governing the behaviors illustrated in the text are kept to a minimum. The text clarifies some still unresolved controversies pertaining to the physical nature of the dominatin