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Descrizione fisica	1 online resource (340 p.)
Collana	Simulation Foundations, Methods and Applications, , 2195-2825
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Nota di bibliografia	Includes bibliographical references and indexes at the end of each chapters.
Nota di contenuto	Diffusive Processes and Modeling -- Diffusion and Transport of Molecules in Living Cells -- Modeling the Diffusion and Transport of Suspended Sediment in Open Channels, Using Two-Phase Flow Theory -- Mathematical Modeling of Peristaltic Pumping of Nano-Fluids -- Numerical Study on Isotachophoretic Separation of Ionic Samples in Microfluidics -- Thermal Characterization of Non-Homogeneous Media -- Scale Dependent Porous Dispersion Resulting from the Cumulative Effects of Velocity Fluctuations -- Modeling Nitrogen Fate and Transport at the Sediment-Water Interface -- Modeling Groundwater Flow in Unconfined Aquifers -- Two-Dimensional Solute Transport from a Varying Pulse-Type Point Source -- The Problem of Futile Cycles in Metabolic Flux Modeling -- Contaminant Concentration Prediction Along Unsteady Groundwater Flow -- Wavelet-Multigrid Method for Solving Modified Reynolds Equation Modeling Synovial Fluid Flow in a Normal Human Knee Joint -- A Basic Concept on Modeling Soil Organic Carbon -- Crop Growth Simulation Modeling.

Sommario/riassunto

Computer simulation and mathematical modelling are the most important approaches in the quantitative analysis of the diffusive processes fundamental to many physical, chemical, biological, and geological systems. This comprehensive text/reference addresses the key issues in the Modelling and Simulation of Diffusive Processes from a broad range of different application areas. Applying an holistic approach, the book presents illuminating viewpoints drawn from an international selection of experts across a wide spectrum of disciplines, from computer science, mathematics and engineering, to natural resource management, environmental sciences, applied geo-sciences, agricultural sciences, and theoretical medicine. Topics and features: Presents a detailed introduction to diffusive processes and modelling Discusses diffusion and molecular transport in living cells, and suspended sediment in open channels Examines the mathematical modelling of peristaltic transport of nanofluids, and isotachophoretic separation of ionic samples in microfluidics Reviews thermal characterization of non-homogeneous media, and scale-dependent porous dispersion resulting from velocity fluctuations Describes the modelling of nitrogen fate and transport at the sediment-water interface, and groundwater flow in unconfined aquifers Investigates two-dimensional solute transport from a varying pulse type point source, and futile cycles in metabolic flux modelling Studies contaminant concentration prediction along unsteady groundwater flow, and modelling synovial fluid flow in human joints Explores the modelling of soil organic carbon, and crop growth simulation This interdisciplinary volume will be invaluable to researchers, lecturers and graduate students from such diverse fields as computer science, mathematics, hydrology, agriculture and biology.