



Percolation Theory for Flow in Porous Media [

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Geography Hydraulic engineering Mathematical geography Physics
 Statistical physics Thermodynamics Engineering Earth Sciences
 Mathematical Applications in Earth Sciences Mechanics, Fluids,
 Thermodynamics Complexity Statistical Physics Hydrogeology

Monografía

This monograph presents, for the first time, a unified and comprehensive introduction to some of the basic transport properties of porous media, such as electrical and hydraulic conductivity, air permeability and diffusion. The treatment is based on critical path analysis and the scaling of transport properties which are individually described as functions of saturation. At the same time, the book supplies a tutorial on percolation theory for hydrologists, providing them with the tools for solving actual problems. In turn, a separate chapter serves to introduce physicists to some of the language and complications of groundwater hydrology necessary for successful modelling. End of chapter problems often indicate open questions, on which young researchers entering the field can readily start work on. This significantly revised and much expanded edition was made necessary by both the selling out of the first edition and the rapid progress in the field. At the same time the tutorial aspects of the first few chapters have been considerably improved and the number of models, experiments and range of medium properties considered have been increased. Topics discussed for the first time in detail in this edition are advanced topological aspects of percolation theory that serve as a basis for examining dispersion aspects in porous media. "The book is suitable for advanced graduate courses, with selected problems and questions appearing at the end of each chapter. [...] I think the book is an important work that will guide soil scientists, hydrologists, and physicists to gain a better qualitative and quantitative understanding of multitransport properties of soils." (Marcel G. Schaap, Soil Science Society of America Journal, May-June, 2006)

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