1. Record Nr. UNINA9910847588303321

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Titolo	Statistical Rock Physics / / by Gabor Korvin
Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2024
ISBN	3-031-46700-0
Edizione	[1st ed. 2024.]
Descrizione fisica	1 online resource (541 pages)
Collana	Earth and Environmental Sciences Library, , 2730-6682
Disciplina	552.06
Soggetti	Geophysics Petrology Mineralogy
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Random functions and random fields, autocorrelation functions -- Coordination number of grains -- Entropy and rock physics -- Effective properties of rocks -- Markov random fields and random walks -- Thermodynamic algorithms.
Sommario/riassunto	The book is the first systematic and comprehensive treatise of stochastic models and computational tools that have emerged in rock-physics in the last 20 years. The field of statistical rock-physics is a part of rock-physics (Petrophysics). Its concepts, methods and techniques are borrowed from stochastic geometry and statistical physics. This discipline describes the interior geometry of rocks; derives their effective physical properties based on their random composition and the random arrangement of their constituents; and builds models to simulate the past geological processes that had formed the rock. The aim of the book is to help the readers to understand the claims, techniques and published results of this new field and—most importantly—to teach them in order to creatively apply stochastic geometry and statistical physics in their own research tasks. For this purpose, the underlying mathematics will be discussed in all sections of the book; numerical solutions will be highlighted; a full set of references will be provided; and theory will go hand-in-hand with practical applications to hydraulic permeability, electric conduction, rock failure, NMR, mechanics of random grain packings, as well as the

compaction of shale.