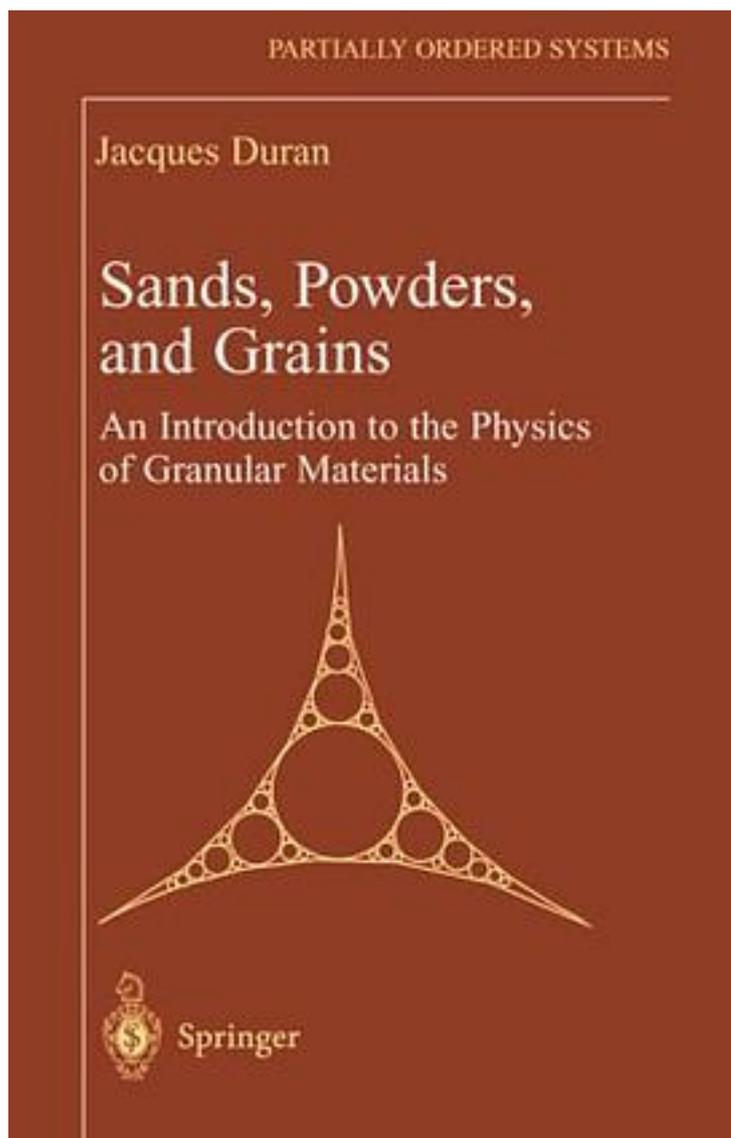


# Sands, Powders, and Grains



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This book is an introduction to the physical principles underlying the behavior of materials consisting of grains. Such materials can be found in an enormous variety of places, ranging from the powders used to make vitamin pills to the rings of Saturn, from beaches to grain elevators, and from pottery clay to interstellar dust. Granular materials have interested physicists from Coulomb and Faraday to Reynolds and Rayleigh, but only recently have mathematical and experimental methods been developed to analyze their properties in detail. This text develops the fundamental physics of the behavior of granular materials. It covers the basic properties of flow, friction, and fluidization of uniform granular materials; discusses mixing and segregation of heterogeneous materials (the famous "brazil-nut problem"); and concludes with an introduction to numerical models. The presentation begins with simple experiments and uses their results to build concepts and theorems about materials whose behavior is often quite counter-intuitive; it aims to present in a unified way the background needed to understand current work in the field. Developed for students at the University of Paris, the text will be suitable for advanced undergraduates and beginning graduate students; it should also be of interest to researchers and engineers just entering the field.

作者介绍:

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## 标签

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