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Titolo	Granular Gases [[electronic resource] /] / edited by Thorsten Pöschel, Stefan Luding
Pubbl/distr/stampa	Berlin, Heidelberg : , : Springer Berlin Heidelberg : , : Imprint : Springer, , 2001
ISBN	3-540-44506-4
Edizione	[1st ed. 2001.]
Descrizione fisica	1 online resource (IX, 457 p.)
Collana	Lecture Notes in Physics, , 0075-8450 ; ; 564
Disciplina	533/.2
Soggetti	Condensed matter Continuum physics Statistical physics Dynamical systems Amorphous substances Complex fluids Mechanics Mechanics, Applied Condensed Matter Physics Classical and Continuum Physics Complex Systems Soft and Granular Matter, Complex Fluids and Microfluidics Theoretical and Applied Mechanics Statistical Physics and Dynamical Systems
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Kinetic Theory and Hydrodynamics -- Kinetic Theory of Granular Gases -- Free Cooling of Particles with Rotational Degrees of Freedom -- Hydrodynamic Transport Coefficients of Granular Gases -- Granular Gases: Probing the Boundaries of Hydrodynamics -- Granular Gases with Impact-Velocity-Dependent Restitution Coefficient -- Boundary Conditions for Collisional Grain Flows at Bumpy, Frictional Walls -- Diffusion Process in Two-Dimensional Granular Gases -- Collisions and One-Dimensional Models -- Energy Loss and Aggregation Processes in

Low Speed Collisions of Ice Particles Coated with Frosts or Methanol/Water Mixtures -- Contact Mechanics and Coefficients of Restitution -- Kinetic Theory for 1D Granular Gases -- Chains of Viscoelastic Spheres -- Vibrated Granular Media -- Experimental Studies of Vibro-fluidised Granular Beds -- Pattern Formation in a Vibrated Granular Layer -- Experimental Study of a Granular Gas Fluidized by Vibrations -- Computer Simulation of Vertically Vibrated Granular Layers in a Box with Sawtooth-Shaped Base -- Resonance Oscillations in Granular Gases -- Granular Astrophysics -- Dynamical Evolution of Viscous Discs. Astrophysical Applications to the Formation of Planetary Systems and to the Confinement of Planetary Rings and Arcs -- Numerical Simulations of the Collisional Dynamics of Planetary Rings -- Formation of Narrow Ringlets in Saturn's Rings -- Granular Viscosity, Planetary Rings and Inelastic Particle Collisions -- Towards Dense Granular Systems -- The Equation of State for Almost Elastic, Smooth, Polydisperse Granular Gases for Arbitrary Density -- Experimental Observations of Non-equilibrium Distributions and Transitions in a 2D Granular Gas -- Effect of Excluded Volume and Anisotropy on Granular Statistics: "Fermi Statistics" and Condensation -- How Much Can We Simplify a System of Grains?.

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Sommario/riassunto

"Granular Gases" are diluted many-particle systems in which the mean free path of the particles is much larger than the typical particle size, and where particle collisions occur dissipatively. The dissipation of kinetic energy can lead to effects such as the formation of clusters, anomalous diffusion and characteristic shock waves to name but a few. The book is organized as follows: Part I comprises the rigorous theoretical results for the dilute limit. The detailed properties of binary collisions are described in Part II. Part III contains experimental investigations of granular gases. Large-scale behaviour as found in astrophysical systems is discussed in Part IV. Part V, finally, deals with possible generalizations for dense granular systems.

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