Record Nr.	UNINA9910458399303321
Titolo	Granular and complex materials [[electronic resource] /] / editors, T. Aste, T. Di Matteo, A. Tordesillas
Pubbl/distr/stampa	New Jersey, : World Scientific, c2007
ISBN	1-281-91187-9 9786611911874 981-277-199-9
Descrizione fisica	1 online resource (268 p.)
Collana	World Scientific lecture notes in complex systems ; ; v. 8
Altri autori (Persone)	AsteTomaso Di MatteoT TordesillasA
Disciplina	620/.43
Soggetti	Granular materials Micromechanics Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"These lecture notes present invited lectures and selected contributions from the 20th Canberra International Physics Summer School and Workshop on Granular Materials, held at the Australian National University in Canberrra, between the 4th and the 8th of December 2006"P. vii.
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Contents; Preface; Chapter 1 Foam as granular matter D. Weaire, V. Langlois, M. Saadatfar and S. Hutzler; 1. Introduction; 1.1. History of foam research; 1.2. Space and time scales; 1.3. Key physical parameters; 1.4. Wet and dry foams; 1.5. Emulsions; 2. Static properties; 2.1. Structure; 2.2. Crystallization; 2.3. Drainage; 3. Dynamic properties; 3.1. Rheology; 3.2. Shear banding; 3.3. Dilatancy; 4. Bubbles as soft grains ?; 5. Seeing inside foams (Computed Tomography); Granular materials; Cellular Solids; Aqueous foams; 6. Conclusions; 7. Acknowledgements; References Chapter 2 Delaunay simplex analysis of the structure of equal sized spheres A.V. Anikeenko, N.N. Medvedev, T. Di Matteo, G.W. Delaney and T. Aste1. Introduction; 2. Models; 3. Results; 4. Conclusion; Acknowledgements; References; Chapter 3 On entropic characterization

1.

	of granular materials R. Blumenfeld; 1. Introduction: the entropic formalism; 2. Calculations of volume-based structural properties; 3. Calculations of other structural properties; 4. The entropic formalism and mechanical stresses; References; Chapter 4 Mathematical modeling of granular flow-slides I. Vardoulakis and S. Alevizos 1. Introduction2. The continuum assumption; 3. The motion; 4. The material time derivative; 5. Mass storage in open channel flow; 6. St. Venant's "shallow water theory"; 7. "Shallow-water" model of granular flows; 8. Mass conservation in granular flows; 9. The dynamic equation of granular flow; 10. Steady granular flows; 11. The Forterre-Pouliquen scaling; 12. An erosion-speed model; 13. The dynamic system; 14. The long wave-length linear stability limit; 15. Mathematical modeling of granular flow-slides: Some open questions; References Chapter 5 The mechanics of brittle granular materials I. Einav1. Introduction; 2. Modelling evolving grading: the mathematical approach; 3. Modelling evolving grading: the physical approach; 4. Surface energy, fractional energy & self organisation; 5. Fracture propagation criterion; 6. Conclusions; References; Chapter 6 Stranger than friction: force chain buckling and its implications for constitutive modelling A. Tordesillas; 1. Introduction; 2. The thermomicromechanical approach; (a) Dissipation on the micro or contact scale; (b) Dissipation on the mesoscale
Sommario/riassunto	The science of complex materials continues to engage researchers from a vast range of disciplines, including physics, mathematics, computational science, and virtually all domains of engineering. This volume presents a unique multidisciplinary panorama of the current research in complex materials. The contributions explore an array of problems reflecting recent developments in four main areas: characterization and modeling of disordered packings, micromechanics and continuum theory; discrete element method; statistical mechanics. The common theme is the quest to unravel the connection betwee