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   Titolo   Coherent Structures in Granular Crystals : From Experiment and
                        Modelling to Computation and Mathematical Analysis / / by
                        Christopher Chong, Panayotis G. Kevrekidis

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   Edizione   [1st ed. 2018.]

   Descrizione fisica   1 online resource (100 pages)

   Collana   SpringerBriefs in Physics, , 2191-5423

   Disciplina   620.43

   Soggetti   Amorphous substances
                        Complex fluids
                        Mathematical physics
                        Physics
                        Applied mathematics
                        Engineering mathematics
                        Building materials
                        Soft and Granular Matter, Complex Fluids and Microfluidics
                        Mathematical Applications in the Physical Sciences
                        Mathematical Methods in Physics
                        Mathematical and Computational Engineering
                        Structural Materials

   Lingua di pubblicazione   Inglese

   Formato   Materiale a stampa

   Livello bibliografico   Monografia

   Nota di bibliografia   Includes bibliographical references.

   Nota di contenuto   Introduction and Motivation of Models -- Shock Waves -- Traveling
                        Solitary Waves -- Discrete (Dark) Breathers -- Heterogeneous Media --
                        Variations on the Theme -- Conclusions and Outlook.

   Sommario/riassunto   This book summarizes a number of fundamental developments at the
                        interface of granular crystals and the mathematical and computational
                        analysis of some of their key localized nonlinear wave solutions. The
                        subject presents a blend of the appeal of granular crystals as a
                        prototypical engineering tested for a variety of diverse applications, the
                        novelty in the nonlinear physics of its coherent structures, and the

tractability of a series of mathematical and computational techniques to analyse them. While the focus is on principal one-dimensional solutions such as shock waves, traveling waves, and discrete breathers, numerous extensions of the discussed patterns, e.g., in two dimensions, chains with defects, heterogeneous settings, and other recent developments are discussed. The book appeals to researchers in the field, as well as for graduate and advanced undergraduate students. It will be of interest to mathematicians, physicists and engineers alike.