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Autore	Zaccone Alessio
Titolo	Theory of Disordered Solids : From Atomistic Dynamics to Mechanical, Vibrational, and Thermal Properties / / by Alessio Zaccone
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Soggetti	Condensed matter Glass Materials science—Data processing Thermodynamics Soft condensed matter Materials—Analysis Condensed Matter Physics Atomistic Models Soft and Granular Matter Characterization and Analytical Technique
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Nota di contenuto	A Bird’s Eye View of Amorphous Solids -- Elasticity -- Viscoelasticity -- Wave Propagation and Damping -- Phonons and Vibrational Spectrum -- Thermal Properties -- Viscosity of Supercooled Liquids -- Plastic Deformation -- Confinement Effects.
Sommario/riassunto	This book presents a consistent mathematical theory of the non-electronic physical properties of disordered and amorphous solids, starting from the atomic-level dynamics and leading to experimentally verifiable descriptions of macroscopic properties such as elastic and viscoelastic moduli, plasticity, phonons and vibrational spectra, and thermal properties. This theory begins with the assumption of the undeniable existence of an “amorphous lattice”, which allows one to relegate the theoretical uncertainties about the ultimate nature of the

glass transition to a subsidiary role and thus take a more pragmatic approach towards the modelling of physical properties. The book introduces the reader not only to the subtle physical concepts underlying the dynamics, mechanics, and statistical physics of glasses and amorphous solids, but also to the essential mathematical and numerical methods that cannot be readily gleaned from specialized literature since they are spread out among many often technically demanding papers. These methods are presented in this book in such a way as to be sufficiently general, allowing for the mathematical or numerical description of novel physical phenomena observed in many different types of amorphous solids (including soft and granular systems), regardless of the atomistic details and particular chemistry of the material. This monograph is aimed at researchers and graduate-level students in physics, materials science, physical chemistry and engineering working in the areas of amorphous materials, soft matter and granular systems, statistical physics, continuum mechanics, plasticity, and solid mechanics. It is also particularly well suited to those working on molecular dynamics simulations, molecular coarse-grained simulations, as well as ab initio atomistic and DFT methods for solid-state and materials science.