1. Record Nr. UNINA9910728388903321

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Titolo	Pair-Correlation Effects in Many-Body Systems : Towards a Complete Theoretical Description of Pair-Correlations in the Static and Kinetic Description of Many-Body Systems / / by Kristian Blom
Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2023
ISBN	9783031296123 9783031296116
Edizione	[1st ed. 2023.]
Descrizione fisica	1 online resource (189 pages)
Collana	Springer Theses, Recognizing Outstanding Ph.D. Research, , 2190-5061
Disciplina	530.1433
Soggetti	Quantum electrodynamics Physics Condensed matter Mathematical physics Quantum Electrodynamics, Relativistic and Many-body Calculations Classical and Continuum Physics Strongly Correlated Systems Mathematical Physics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	1. Introduction -- 2. Bethe-Guggenheim approximation for uniform systems -- 3. Bethe-Guggenheim approximation for non-uniform systems -- 4. Delocalization-Induced Interface Broadening in Strongly Interacting Systems -- 5. Criticality in Cell Adhesion -- 6. Global Speed Limit for Finite-Time Dynamical Phase Transition in Nonequilibrium Relaxation -- 7. Conclusion and Outlook.
Sommario/riassunto	The laws of nature encompass the small, the large, the few, and the many. In this book, we are concerned with classical (i.e., not quantum) many-body systems, which refers to any microscopic or macroscopic system that contains a large number of interacting entities. The nearest-neighbor Ising model, originally developed in 1920 by Wilhelm Lenz, forms a cornerstone in our theoretical understanding of collective effects in classical many-body systems and is to date a paradigm for

statistical physics. Despite its elegant and simplistic description, exact analytical results in dimensions equal and larger than two are difficult to obtain. Therefore, much work has been done to construct methods that allow for approximate, yet accurate, analytical solutions. One of these methods is the Bethe-Guggenheim approximation, originally developed independently by Hans Bethe and Edward Guggenheim in 1935. This approximation goes beyond the well-known mean field approximation and explicitly accounts for pair correlations between the spins in the Ising model. In this book, we embark on a journey to exploit the full capacity of the Bethe-Guggenheim approximation, in non-uniform and non-equilibrium settings. Throughout we unveil the non-trivial and a priori non-intuitive effects of pair correlations in the classical nearest-neighbor Ising model, which are taken into account in the Bethe-Guggenheim approximation and neglected in the mean field approximation.