1. Record Nr. UNINA9910373931903321

Autore	Pomeau Yves
Titolo	Statistical Physics of Non Equilibrium Quantum Phenomena / / by Yves Pomeau, Minh-Binh Tran
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2019
ISBN	3-030-34394-4
Edizione	[1st ed. 2019.]
Descrizione fisica	1 online resource (232 pages)
Collana	Lecture Notes in Physics, , 0075-8450 ; ; 967
Disciplina	530.42
Soggetti	Statistical physics Partial differential equations Statistical Physics and Dynamical Systems Partial Differential Equations
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Part I Statistical Physics of the Interaction of a Single Atom or Ion with Radiation -- Introduction -- The Kolmogorov Equation for a Two-Level System -- The Statistical Theory of Shelving -- Summary, Conclusion and Appendix of Part 1 -- Part II Statistical Physics of Dilute Bose Gases -- Introduction -- Quantum Boltzmann Equations -- Formation of Singularities -- Hydrodynamic Approximations -- Equilibrium Properties of a Dilute Bose Gas with Small Coupling at First Order -- Mathematical Analysis of the Coupling Condensate -Thermal Cloud Systems. .
Sommario/riassunto	This book provides an introduction to topics in non-equilibrium quantum statistical physics for both mathematicians and theoretical physicists. The first part introduces a kinetic equation, of Kolmogorov type, which is needed to describe an isolated atom (actually, in experiments, an ion) under the effect of a classical pumping electromagnetic field which keeps the atom in its excited state(s) together with the random emission of fluorescence photons which put it back into its ground state. The quantum kinetic theory developed in the second part is an extension of Boltzmann's classical (non-quantum) kinetic theory of a dilute gas of quantum bosons. This is the source of many interesting fundamental questions, particularly because, if the

temperature is low enough, such a gas is known to have at equilibrium a transition, the Bose–Einstein transition, where a finite portion of the particles stay in the quantum ground state. An important question considered is how a Bose gas condensate develops in time if its energy is initially low enough.