

1. Record Nr.	UNINA9910155320803321
Autore	Bru J.-B
Titolo	Lieb-Robinson Bounds for Multi-Commutators and Applications to Response Theory // by J.-B. Bru, W. de Siqueira Pedra
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2017
Edizione	[1st ed. 2017.]
Descrizione fisica	1 online resource (VII, 109 p.)
Collana	SpringerBriefs in Mathematical Physics, , 2197-1757 ; ; 13
Disciplina	530.12
Soggetti	Physics Mathematical physics Functional analysis Condensed matter Quantum computers Spintronics Mathematical Methods in Physics Mathematical Physics Functional Analysis Condensed Matter Physics Quantum Information Technology, Spintronics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Introduction -- Algebraic Quantum Mechanics -- Algebraic Setting for Interacting Fermions on the Lattice -- Lieb–Robinson Bounds for Multi–Commutators -- Lieb–Robinson Bounds for Non–Autonomous Dynamics -- Applications to Conductivity Measures.
Sommario/riassunto	Lieb-Robinson bounds for multi-commutators are effective mathematical tools to handle analytic aspects of infinite volume dynamics of non-relativistic quantum particles with short-range, possibly time-dependent interactions. In particular, the existence of fundamental solutions is shown for those (non-autonomous) C*-dynamical systems for which the usual conditions found in standard theories of (parabolic or hyperbolic) non-autonomous evolution

equations are not given. In mathematical physics, bounds on multi-commutators of an order higher than two can be used to study linear and non-linear responses of interacting particles to external perturbations. These bounds are derived for lattice fermions, in view of applications to microscopic quantum theory of electrical conduction discussed in this book. All results also apply to quantum spin systems, with obvious modifications. In order to make the results accessible to a wide audience, in particular to students in mathematics with little Physics background, basics of Quantum Mechanics are presented, keeping in mind its algebraic formulation. The  $C^*$ -algebraic setting for lattice fermions, as well as the celebrated Lieb-Robinson bounds for commutators, are explained in detail, for completeness.

---