1.	Record Nr.	UNINA9910165139203321
	Autore	Obata Nobuaki
	Titolo	Spectral analysis of growing graphs : a quantum probability point of view / / by Nobuaki Obata
	Pubbl/distr/stampa	Singapore : , : Springer Singapore : , : Imprint : Springer, , 2017
	ISBN	981-10-3506-7
	Edizione	[1st ed. 2017.]
	Descrizione fisica	1 online resource (VIII, 138 p. 22 illus., 9 illus. in color.)
	Collana	SpringerBriefs in Mathematical Physics, , 2197-1757 ; ; 20
	Disciplina	515.7222
	Soggetti	Mathematical physics Probabilities Graph theory Mathematical Physics Probability Theory and Stochastic Processes Graph Theory
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Nota di bibliografia	Includes bibliographical references and index.
	Nota di contenuto	1. Graphs and Matrices -- 2. Spectra of Finite Graphs -- 3. Spectral Distributions of Graphs -- 4. Orthogonal Polynomials and Fock Spaces -- 5. Analytic Theory of Moments -- 6. Method of Quantum Decomposition -- 7. Graph Products and Asymptotics -- References -- Index.
	Sommario/riassunto	This book is designed as a concise introduction to the recent achievements on spectral analysis of graphs or networks from the point of view of quantum (or non-commutative) probability theory. The main topics are spectral distributions of the adjacency matrices of finite or infinite graphs and their limit distributions for growing graphs. The main vehicle is quantum probability, an algebraic extension of the traditional probability theory, which provides a new framework for the analysis of adjacency matrices revealing their non-commutative nature. For example, the method of quantum decomposition makes it possible to study spectral distributions by means of interacting Fock spaces or equivalently by orthogonal polynomials. Various concepts of independence in quantum probability and corresponding central limit theorems are used for the asymptotic study of spectral distributions for

product graphs. This book is written for researchers, teachers, and students interested in graph spectra, their (asymptotic) spectral distributions, and various ideas and methods on the basis of quantum probability. It is also useful for a quick introduction to quantum probability and for an analytic basis of orthogonal polynomials.