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	Titolo	Quantum Mechanics : Axiomatic Approach and Understanding Through Mathematics / / by Tapan Kumar Das
	Pubbl/distr/stampa	Singapore : , : Springer Nature Singapore : , : Imprint : Springer, , 2023
	ISBN	981-9904-94-3
	Edizione	[1st ed. 2023.]
	Descrizione fisica	1 online resource (319 pages)
	Collana	UNITEXT for Physics, , 2198-7890
	Disciplina	530.120151
	Soggetti	Quantum theory
		Mathematics
		Mathematical physics
		Quantum electrodynamics
		Quantum Physics
		Applications of Mathematics
		Theoretical, Mathematical and Computational Physics
		Quantum Electrodynamics, Relativistic and Many-body Calculations
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Nota di bibliografia	Includes bibliographical references and index.
	Nota di contenuto	1. Introduction -- 2. Mathematical preliminary I -- 3. Axiomatic approach to Quantum Mechanics -- 4. Formulation of Quantum Mechanics -- 5. General uncertainty relation -- 6. Harmonic oscillator: operator method -- 7. Mathematical preliminary II -- 8. Solution of Schrodinger equation -- 9. One-dimensional potentials -- 10. Three dimensional problem -- 11. Hydrogen-type atoms -- 12. Particle in a 3-D well -- 13. Scattering in 1-dimension -- 14. Scattering in 3-dimension.
	Sommario/riassunto	This book provides a clear understanding of quantum mechanics (QM) by developing it from fundamental postulates in an axiomatic manner, as its central theme. The target audience is physics students at master's level. It avoids historical developments, which are piecemeal, not logically well knitted, and may lead to misconceptions. Instead, in the present approach all of QM and all its rules are developed logically starting from the fundamental postulates only and no other assumptions. Specially noteworthy topics have been developed in a

smooth contiguous fashion following the central theme. They provide a new approach to understanding QM. In most other texts, these are presented as disjoint separate topics. Since the reader may not be acquainted with advanced mathematical topics like linear vector space, a number of such topics have been presented as "mathematical preliminary." Standard topics, viz. derivation of uncertainty relations, simple harmonic oscillator by operator method, bound systems in one and three dimensions, angular momentum, hydrogen-like atom, and scattering in one and three dimensions, are woven into the central theme. Advanced topics like approximation methods, spin and generalized angular momenta, addition of angular momenta, and relativistic quantum mechanics have been reserved for Volume II.