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Titolo	Foundations of Quantum Theory : From Classical Concepts to Operator Algebras // by Klaas Landsman
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Descrizione fisica	1 online resource (XXXVI, 861 p. 9 illus., 8 illus. in color.)
Collana	Fundamental Theories of Physics, , 0168-1222 ; ; 188
Disciplina	530.12
Soggetti	Quantum physics Mathematical physics Physics Matrix theory Algebra Quantum Physics Mathematical Physics History and Philosophical Foundations of Physics Linear and Multilinear Algebras, Matrix Theory
Lingua di pubblicazione	Inglese
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Nota di contenuto	Introduction -- Part I $Co(X)$ and $B(H)$: Classical physics on a finite phase space -- Quantum mechanics on a finite-dimensional Hilbert space -- Classical physics on a general phase space -- Quantum physics on a general Hilbert space -- Symmetry in quantum mechanics -- Part II Between $Co(X)$ and $B(H)$: Classical models of quantum mechanics -- Limits: Small \hbar -- Limits: large N -- Symmetry in algebraic quantum theory -- Spontaneous Symmetry Breaking -- The Measurement Problem -- Topos theory and quantum logic -- Appendix A: Finite-dimensional Hilbert spaces -- Appendix B: Basic functional analysis -- Appendix C: Operator algebras -- Appendix D: Lattices and logic -- Appendix E: Category theory and topos theory -- References.
Sommario/riassunto	This book studies the foundations of quantum theory through its relationship to classical physics. This idea goes back to the

Copenhagen Interpretation (in the original version due to Bohr and Heisenberg), which the author relates to the mathematical formalism of operator algebras originally created by von Neumann. The book therefore includes comprehensive appendices on functional analysis and C^* -algebras, as well as a briefer one on logic, category theory, and topos theory. Matters of foundational as well as mathematical interest that are covered in detail include symmetry (and its "spontaneous" breaking), the measurement problem, the Kochen-Specker, Free Will, and Bell Theorems, the Kadison-Singer conjecture, quantization, indistinguishable particles, the quantum theory of large systems, and quantum logic, the latter in connection with the topos approach to quantum theory. This book is Open Access under a CC BY licence.
