

Varadarajan, V. S.

Geometry of quantum theory. 2nd ed. (English) Zbl 0581.46061

New York etc.: Springer-Verlag. XVIII, 412 p. DM 178.00 (1985).

An account of numerous successful encounters of mathematics and physics can hardly become obsolete. Hence the present re-publication of "Geometry of quantum theory" is a most welcome event. Out of the two original volumes [(1968; [Zbl 0155.568](#)) and (1970; [Zbl 0194.288](#))] now emerges one, the contents of which give the reader a better chance of embracing the comprehensive material. Thus, wisely, the original chapters on projective geometry appear radically compressed. The book takes the reader on a travel through five principal encounters between mathematics and physics - within geometry, logic, algebra and analysis. Since by "geometry", the author understands an irreducible complemented modular lattice, it becomes clear that the notion of geometry plays the leading role. Chapters from one to four present an interplay of geometry and logic. Chapter five discusses group action on topological spaces, and chapter six gives the reader a fair account of the Mackey systems of imprimitivity. Projective representations are discussed in chapter seven. Chapter eight discusses kinematics and dynamics in the light of the abstract Schrödinger equation, and the last chapter is devoted to the relativistic free particle.

Each chapter is accompanied by notes making the content more up-to-date and supplying old concepts - as for instance that of Fock representation which turned out to be of principal importance but was not mentioned in the original edition.

Reviewer: [W.Słowikowski](#)

MSC:

- [46N99](#) Miscellaneous applications of functional analysis
- [81P10](#) Logical foundations of quantum mechanics; quantum logic (quantum-theoretic aspects)
- [06C20](#) Complemented modular lattices, continuous geometries
- [46-02](#) Research exposition (monographs, survey articles) pertaining to functional analysis

Cited in 2 Reviews Cited in 140 Documents

Keywords:

irreducible complemented modular lattice; interplay of geometry and logic; group action on topological spaces; Mackey systems of imprimitivity; Projective representations; kinematics; dynamics; abstract Schrödinger equation; relativistic free particle; Fock representation