

<<量子力学中的数学概念>>

图书基本信息

书名：<<量子力学中的数学概念>>

13位ISBN编号：9787510005022

10位ISBN编号：7510005027

出版时间：2009-8

出版时间：世界图书出版公司

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页数：286

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前言

The first fifteen chapters of these lectures (omitting four to six chapters each year) cover a one term course taken by a mixed group of senior undergraduate and junior graduate students specializing either in mathematics or physics. Typically, the mathematics students have some background in advanced analysis, while the physics students have had introductory quantum mechanics. To satisfy such a disparate audience, we decided to select material which is interesting from the viewpoint of modern theoretical physics, and which illustrates an interplay of ideas from various fields of mathematics such as operator theory, probability, differential equations, and differential geometry. Given our time constraint, we have often pursued mathematical content at the expense of rigor. However, wherever we have sacrificed the latter, we have tried to explain whether the result is an established fact, or, mathematically speaking, a conjecture, and in the former case, how a given argument can be made rigorous. The present book retains these features. Prerequisites for this book are introductory real analysis (notions of vector space, scalar product, norm, convergence, Fourier transform) and complex analysis, the theory of Lebesgue integration, and elementary differential equations. These topics are typically covered by the third year in mathematics departments. The first and third topics are also familiar to physics undergraduates. Those unfamiliar with Lebesgue integration can think about Lebesgue integrals as if they were Riemann integrals. This said, the pace of the book is not a leisurely one and requires, at least for beginners, some amount of work.

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内容概要

The first fifteen chapters of these lectures (omitting four to six chapters each year) cover a one term course taken by a mixed group of senior undergraduate and junior graduate students specializing either in mathematics or physics. Typically , the mathematics students have some background in advanced analysis , while the physics students have had introductory quantum mechanics. To satisfy such a disparate audience , we decided to select material which is interesting from the viewpoint of modern theoretical physics , and which illustrates an interplay of ideas from various fields of mathematics such as operator theory , probability , differential equations , and differential geometry. Given our time constraint , we have often pursued mathematical content at the expense of rigor. However , wherever we have sacrificed the latter , we have tried to explain whether the result is an established fact , or , mathematically speaking , a conjecture , and in the former case , how a given argument can be made rigorous. The present book retains these features.

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