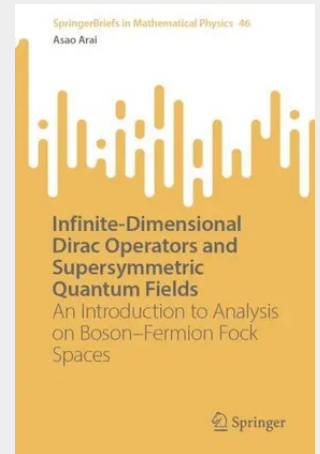


# Infinite-Dimensional Dirac Operators and Supersymmetric Quantum Fields

An Introduction to Analysis on Boson-Fermion Fock Spaces

This book explains the mathematical structures of supersymmetric quantum field theory (SQFT) from the viewpoints of functional and infinite-dimensional analysis. The main mathematical objects are infinite-dimensional Dirac operators on the abstract Boson-Fermion Fock space. The target audience consists of graduate students and researchers who are interested in mathematical analysis of quantum fields, including supersymmetric ones, and infinite-dimensional analysis. The major topics are the clarification of general mathematical structures that some models in the SQFT have in common, and the mathematically rigorous analysis of them. The importance and the relevance of the subject are that in physics literature, supersymmetric quantum field models are only formally (heuristically) considered and hence may be ill-defined mathematically. From a mathematical point of view, however, they suggest new aspects related to infinite-dimensional geometry and analysis. Therefore, it is important to show the mathematical existence of such models first and then study them in detail. The book shows that the theory of the abstract Boson-Fermion Fock space serves this purpose. The analysis developed in the book also provides a good example of infinite-dimensional analysis from the functional analysis point of view, including a theory of infinite-dimensional Dirac operators and Laplacians.

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**58,84 €**

54,99 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

**Artikelnummer:** 9789811956775

**Medium:** Buch

**ISBN:** 978-981-19-5677-5

**Verlag:** Springer

**Erscheinungstermin:** 19.10.2022

**Sprache(n):** Englisch

**Auflage:** 1. Auflage 2022

**Serie:** SpringerBriefs in Mathematical Physics

**Produktform:** Kartoniert

**Gewicht:** 213 g

**Seiten:** 117

**Format (B x H):** 155 x 235 mm

