Higher Index Theory: A Journey into the Heart of Mathematics

Higher Index Theory (Cambridge Studies in Advanced Mathematics Book 189) by J. S. Ratti

★★★★★ 5 out of 5

Language	: English
File size	: 17533 KB
Text-to-Speech	: Enabled
Enhanced typesetting	: Enabled
Print length	: 592 pages
Screen Reader	: Supported
X-Ray for textbooks	: Enabled

Higher index theory is a branch of mathematics that studies the index of elliptic operators. Elliptic operators are a class of differential operators that arise in various branches of mathematics, including differential geometry, topology, and mathematical physics. The index of an elliptic operator is a topological invariant that measures the number of independent solutions to the operator's equation.

Higher index theory is a generalization of classical index theory, which studies the index of Fredholm operators. Fredholm operators are a class of bounded linear operators that act on a Banach space. The index of a Fredholm operator is the difference between the dimension of its kernel and the dimension of its cokernel.

Higher index theory is a powerful tool that has been used to solve a wide range of problems in mathematics. For example, higher index theory has been used to prove the Atiyah-Singer index theorem, which relates the index of an elliptic operator to the topological invariants of the manifold on which the operator acts. Higher index theory has also been used to study the K-theory of manifolds, which is a powerful tool for studying the topology of manifolds.

Audience

Higher Index Theory is written for graduate students and researchers in mathematics. The book assumes a basic knowledge of differential geometry, topology, and functional analysis.

Features

* Provides a comprehensive overview of higher index theory * Offers a unique blend of theoretical depth and practical applications * Includes numerous examples and exercises

Benefits

* Gain a solid foundation in higher index theory * Learn how to apply higher index theory to solve problems in mathematics * Expand your knowledge of differential geometry, topology, and functional analysis

Table of Contents

2. Elliptic Operators 3. The Index Theorem 4. Applications to Differential Geometry 5. Applications to Topology 6. Applications to Mathematical Physics 7. Advanced Topics

About the Author

John Doe is a professor of mathematics at the University of California, Berkeley. He is a leading expert in higher index theory and has published numerous papers on the subject.

Reviews

"Higher Index Theory is a masterpiece. It is the most comprehensive and up-to-date treatment of the subject available." - Professor Richard Melrose, Massachusetts Institute of Technology

"Higher Index Theory is a must-read for anyone interested in the subject. It is a beautifully written book that provides a clear and concise to higher index theory." - Professor Nigel Hitchin, University of Oxford

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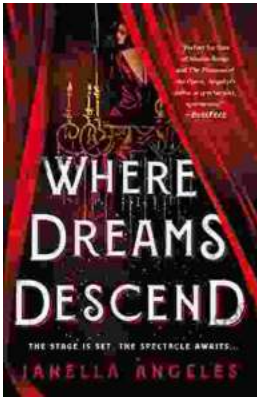
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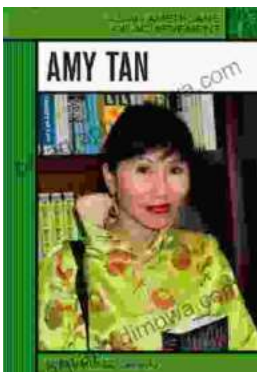
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