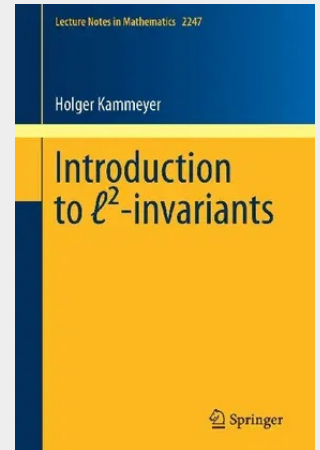


Introduction to ζ^2 -invariants

This book introduces the reader to the most important concepts and problems in the field of ℓ^2 -invariants. After some foundational material on group von Neumann algebras, ℓ^2 -Betti numbers are defined and their use is illustrated by several examples. The text continues with Atiyah's question on possible values of ℓ^2 -Betti numbers and the relation to Kaplansky's zero divisor conjecture. The general definition of ℓ^2 -Betti numbers allows for applications in group theory. A whole chapter is dedicated to Lück's approximation theorem and its generalizations. The final chapter deals with ℓ^2 -torsion, twisted variants and the conjectures relating them to torsion growth in homology. The text provides a self-contained treatment that constructs the required specialized concepts from scratch. It comes with numerous exercises and examples, so that both graduate students and researchers will find it useful for self-study or as a basis for an advanced lecture course.

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