1. Record Nr. UNINA9911031664003321

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Titolo	Isomorphism Conjectures in K- and L-Theory / / by Wolfgang Lück
Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2025
ISBN	3-031-98976-7
Edizione	[1st ed. 2025.]
Descrizione fisica	1 online resource (881 pages)
Collana	Ergebnisse der Mathematik und ihrer Grenzgebiete. 3. Folge / A Series of Modern Surveys in Mathematics, , 2197-5655 ; ; 78
Altri autori (Persone)	WingesChristoph
Disciplina	512.66
Soggetti	K-theory Algebraic topology Manifolds (Mathematics) Algebra, Homological Global analysis (Mathematics) Topological groups Lie groups K-Theory Algebraic Topology Manifolds and Cell Complexes Category Theory, Homological Algebra Global Analysis and Analysis on Manifolds Topological Groups and Lie Groups
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
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Methods of Proofs -- 19 Motivation, Summary, and History of the Proofs of the Farrell–Jones Conjecture -- 20 Conditions on a Group Implying the Farrell–Jones Conjecture -- 21 Controlled Topology Methods -- 22 Coverings and Flow Spaces -- 23 Transfer -- 24 Higher Categories as Coefficients -- 25 Analytic Methods -- 26 Solutions to the Exercises.

Sommario/riassunto

This monograph is devoted to the Isomorphism Conjectures formulated by Baum and Connes, and by Farrell and Jones. These conjectures are central to the study of the topological K-theory of reduced group C*-algebras and the algebraic K- and L-theory of group rings. They have far-reaching applications in algebra, geometry, group theory, operator theory, and topology. The book provides a detailed account of the development of these conjectures, their current status, methods of proof, and their wide-ranging implications. These conjectures are not only powerful tools for concrete computations but also play a crucial role in proving other major conjectures. Among these are the Borel Conjecture on the topological rigidity of aspherical closed manifolds, the (stable) Gromov–Lawson–Rosenberg Conjecture on the existence of Riemannian metrics with positive scalar curvature on closed Spin-manifolds, Kaplansky's Idempotent Conjecture and the related Kadison Conjecture, the Novikov Conjecture on the homotopy invariance of higher signatures, and conjectures concerning the vanishing of the reduced projective class group and the Whitehead group of torsionfree groups.