

Equivariant E-Theory for C*-Algebras

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Equivariant E Theory For C Algebras

David Kirk



Equivariant E Theory For C Algebras:

Equivariant E-theory for C^* -algebras Erik Guentner,2000 Let A and B be C algebras which are equipped with continuous actions of a second countable locally compact group G We define a notion of equivariant asymptotic morphism and use it to define equivariant E theory groups $E_G(A, B)$ which generalize the E theory groups of Connes and Higson We develop the basic properties of equivariant E theory including a composition product and six term exact sequences in both variables and apply our theory to the problem of calculating K theory for group C algebras Our main theorem gives a simple criterion for the assembly map of Baum and Connes to be an isomorphism The result plays an important role in recent work of Higson and Kasparov on the Baum Connes conjecture for groups which act isometrically and metrically properly on Hilbert space

Equivariant SE -Theory for C^ -Algebras* Erik Guentner,Nigel Higson,Jody Trout,2000 This title examines the equivariant e theory for C algebra focusing on research carried out by Higson and Kasparov Let A and B be C algebras which are equipped with continuous actions of a second countable locally compact group G We define a notion of equivariant asymptotic morphism and use it to define equivariant E theory groups $EULG(A, B)$ which generalize the E theory groups of Connes and Higson We develop the basic properties of equivariant E theory including a composition product and six term exact sequences in both variables and apply our theory to the problem of calculating K theory for group C algebras Our main theorem gives a simple criterion for the assembly map of Baum and Connes to be an isomorphism The result plays an important role in the work of Higson and Kasparov on the Baum Connes conjecture for groups which act isometrically and metrically properly on Hilbert space

An Introduction to C^ -Algebras and Noncommutative Geometry* Heath Emerson,2024-07-27 This is the first textbook on C algebra theory with a view toward Noncommutative Geometry Moreover it fills a gap in the literature providing a clear and accessible account of the geometric picture of K theory and its relation to the C algebraic picture The text can be used as the basis for a graduate level or a capstone course with the goal being to bring a relative novice up to speed on the basic ideas while offering a glimpse at some of the more advanced topics of the subject Coverage includes C algebra theory K theory K homology Index theory and Connes Noncommutative Riemannian geometry Aimed at graduate level students the book is also a valuable resource for mathematicians who wish to deepen their understanding of noncommutative geometry and algebraic K theory A wide range of important examples are introduced at the beginning of the book There are lots of excellent exercises and any student working through these will benefit significantly Prerequisites include a basic knowledge of algebra analysis and a bit of functional analysis As the book progresses a little more mathematical maturity is required as the text discusses smooth manifolds some differential geometry and elliptic operator theory and K theory The text is largely self contained though occasionally the reader may opt to consult more specialized material to further deepen their understanding of certain details

K -Theory for Group C^* -Algebras and Semigroup C^* -Algebras Joachim Cuntz,Siegfried Echterhoff,Xin Li,Guoliang Yu,2017-10-24 This book gives an account of the

necessary background for group algebras and crossed products for actions of a group or a semigroup on a space and reports on some very recently developed techniques with applications to particular examples Much of the material is available here for the first time in book form The topics discussed are among the most classical and intensely studied C algebras They are important for applications in fields as diverse as the theory of unitary group representations index theory the topology of manifolds or ergodic theory of group actions Part of the most basic structural information for such a C algebra is contained in its K theory The determination of the K groups of C algebras constructed from group or semigroup actions is a particularly challenging problem Paul Baum and Alain Connes proposed a formula for the K theory of the reduced crossed product for a group action that would permit in principle its computation By work of many hands the formula has by now been verified for very large classes of groups and this work has led to the development of a host of new techniques An important ingredient is Kasparov s bivariant K theory More recently also the C algebras generated by the regular representation of a semigroup as well as the crossed products for actions of semigroups by endomorphisms have been studied in more detail Intriguing examples of actions of such semigroups come from ergodic theory as well as from algebraic number theory The computation of the K theory of the corresponding crossed products needs new techniques In cases of interest the K theory of the algebras reflects ergodic theoretic or number theoretic properties of the action

K-Theory for Operator Algebras Bruce Blackadar, 1998-09-13 This book is the only comprehensive treatment of K theory for operator algebras

Operator

Algebras and Operator Theory Liming Ge, 1998 This volume contains the proceedings from the International Conference on Operator Algebras and Operator Theory held at the East China Normal University in Shanghai China Participants in the conference ranged from graduate students to postdocs to leading experts who came from around the world Topics covered were C algebras von Neumann algebras non self adjoint operator algebras wavelets operator spaces and other related areas This work consists of contributions from invited speakers and some mathematicians who were unable to attend It presents important mathematical ideas while maintaining the uniqueness and excitement of this very successful event

Operator Algebras and Their Applications Robert S. Doran, Efton Park, 2016-07-28 his volume contains the proceedings of the AMS Special Session Operator Algebras and Their Applications A Tribute to Richard V Kadison held from January 10 11 2015 in San Antonio Texas Richard V Kadison has been a towering figure in the study of operator algebras for more than 65 years His research and leadership in the field have been fundamental in the development of the subject and his influence continues to be felt though his work and the work of his many students collaborators and mentees Among the topics addressed in this volume are the Kadison Kaplansky conjecture classification of C algebras connections between operator spaces and parabolic induction spectral flow C algebra actions von Neumann algebras and applications to mathematical physics

K-theory and Noncommutative Geometry Guillermo Cortiñas, 2008 Since its inception 50 years ago K theory has been a tool for understanding a wide ranging family of mathematical structures and their invariants topological spaces rings algebraic

varieties and operator algebras are the dominant examples. The invariants range from characteristic classes in cohomology, determinants of matrices, Chow groups of varieties as well as traces and indices of elliptic operators. Thus K theory is notable for its connections with other branches of mathematics. Noncommutative geometry develops tools which allow one to think of noncommutative algebras in the same footing as commutative ones as algebras of functions on noncommutative spaces. The algebras in question come from problems in various areas of mathematics and mathematical physics; typical examples include algebras of pseudodifferential operators, group algebras and other algebras arising from quantum field theory. To study noncommutative geometric problems one considers invariants of the relevant noncommutative algebras. These invariants include algebraic and topological K theory and also cyclic homology discovered independently by Alain Connes and Boris Tsygan which can be regarded both as a noncommutative version of de Rham cohomology and as an additive version of K theory. There are primary and secondary Chern characters which pass from K theory to cyclic homology. These characters are relevant both to noncommutative and commutative problems and have applications ranging from index theorems to the detection of singularities of commutative algebraic varieties. The contributions to this volume represent this range of connections between K theory, noncommutative geometry and other branches of mathematics.

Noncommutative Geometry Alain Connes, Joachim Cuntz, Erik G. Guentner, Nigel Higson, Jerome Kaminker, John E. Roberts, 2003-12-08
Noncommutative Geometry is one of the most deep and vital research subjects of present day Mathematics. Its development mainly due to Alain Connes is providing an increasing number of applications and deeper insights for instance in Foliations, K Theory, Index Theory, Number Theory but also in Quantum Physics of elementary particles. The purpose of the Summer School in Martina Franca was to offer a fresh invitation to the subject and closely related topics; the contributions in this volume include the four main lectures cover advanced developments and are delivered by prominent specialists.

C*-algebras and Elliptic Theory II Dan Burghelea, Richard Melrose, Alexander S. Mishchenko, Evgenij V. Troitsky, 2008-03-18
This book consists of a collection of original refereed research and expository articles on elliptic aspects of geometric analysis on manifolds including singular foliated and non commutative spaces. The topics covered include the index of operators, torsion invariants, K theory of operator algebras and L2 invariants. There are contributions from leading specialists and the book maintains a reasonable balance between research, expository and mixed papers.

A Geometric Setting for Hamiltonian Perturbation Theory Anthony D. Blaom, 2001
In this text the perturbation theory of non commutatively integrable systems is revisited from the point of view of non Abelian symmetry groups. Using a coordinate system intrinsic to the geometry of the symmetry, the book generalizes and geometrizes well known estimates of Nekhoroshev 1977 in a class of systems having almost G invariant Hamiltonians. These estimates are shown to have a natural interpretation in terms of momentum maps and co adjoint orbits. The geometric framework adopted is described explicitly in examples including the Euler-Poincaré rigid body.

Basic Bundle Theory and K-Cohomology Invariants Dale Husemoller, Michael JOACHIM, Branislav Jurco, Martin

Schottenloher, 2007-12-18 Based on several recent courses given to mathematical physics students this volume is an introduction to bundle theory It aims to provide newcomers to the field with solid foundations in topological K theory A fundamental theme emphasized in the book centers around the gluing of local bundle data related to bundles into a global object One renewed motivation for studying this subject comes from quantum field theory where topological invariants play an important role

Perspectives on Noncommutative Geometry Masoud Khalkhali, 2011 This volume represents the proceedings of the Noncommutative Geometry Workshop that was held as part of the thematic program on operator algebras at the Fields Institute in May 2008 Pioneered by Alain Connes starting in the late 1970s noncommutative geometry was originally inspired by global analysis topology operator algebras and quantum physics Its main applications were to settle some long standing conjectures such as the Novikov conjecture and the Baum Connes conjecture Next came the impact of spectral geometry and the way the spectrum of a geometric operator like the Laplacian holds information about the geometry and topology of a manifold as in the celebrated Weyl law This has now been vastly generalized through Connes notion of spectral triples Finally recent years have witnessed the impact of number theory algebraic geometry and the theory of motives and quantum field theory on noncommutative geometry Almost all of these aspects are touched upon with new results in the papers of this volume This book is intended for graduate students and researchers in both mathematics and theoretical physics who are interested in noncommutative geometry and its applications

From Representation Theory to Homotopy Groups Donald M. Davis, 2002 A formula for the odd primary v_1 periodic homotopy groups of a finite H space in terms of its K theory and Adams operations has been obtained by Bousfield This work applies this theorem to give explicit determinations of the v_1 periodic homotopy groups of $E_8/5$ and $E_8/3$ thus completing the determination of all odd primary v_1 periodic homotopy groups of all compact simple Lie groups a project suggested by Mimura in 1989

[Classification of \$\mathcal{O}_\infty\$ -Stable \$C^*\$ -Algebras](#) James Gabe, 2024-02-01 View the abstract

[Mathematical Reviews](#), 2008

C^* -algebras and Elliptic Theory Bogdan Bojarski, Alexander S. Mishchenko, Evgenij V. Troitsky, Andrzej Weber, 2006-11-09 This book consists of reviewed original research papers and expository articles in index theory especially on singular manifolds topology of manifolds operator and equivariant K theory Hopf cyclic cohomology geometry of foliations residue theory Fredholm pairs and others and applications in mathematical physics The wide spectrum of subjects reflects the diverse directions of research for which the starting point was the Atiyah Singer index theorem

Triangulations of Oriented Matroids Francisco Santos, 2002 We consider the concept of triangulation of an oriented matroid We provide a definition which generalizes the previous ones by Billera Munson and by Anderson and which specializes to the usual notion of triangulation or simplicial fan in the realizable case Then we study the relation existing between triangulations of an oriented matroid M and extensions of its dual M^* via the so called lifting triangulations We show that this duality behaves particularly well in the class of Lawrence matroid polytopes In particular that the extension space conjecture

for realizable oriented matroids is equivalent to the restriction to Lawrence polytopes of the Generalized Baues problem for subdivisions of polytopes We finish by showing examples and a characterization of lifting triangulations K-theory in Algebra, Analysis and Topology Guillermo Cortiñas, Charles A. Weibel, 2020 This volume contains the proceedings of the ICM 2018 satellite school and workshop K theory conference in Argentina The school was held from July 16 20 2018 in La Plata Argentina and the workshop was held from July 23 27 2018 in Buenos Aires Argentina The volume showcases current developments in K theory and related areas including motives homological algebra index theory operator algebras and their applications and connections Papers cover topics such as K theory of group rings Witt groups of real algebraic varieties coarse homology theories topological cyclic homology negative K groups of monoid algebras Milnor K theory and regulators noncommutative motives the classification of C algebras via Kasparov's K theory the comparison between full and reduced C crossed products and a proof of Bott periodicity using almost commuting matrices *Topology, C^* -Algebras, and String Duality* Jonathan Rosenberg, 2009-10-27 String theory is the leading candidate for a physical theory that combines all the fundamental forces of nature as well as the principles of relativity and quantum mechanics into a mathematically elegant whole The mathematical tools used by string theorists are highly sophisticated and cover many areas of mathematics As with the birth of quantum theory in the early 20th century the mathematics has benefited at least as much as the physics from the collaboration In this book based on CBMS lectures given at Texas Christian University Rosenberg describes some of the most recent interplay between string dualities and topology and operator algebras The book is an interdisciplinary approach to duality symmetries in string theory It can be read by either mathematicians or theoretical physicists and involves a more or less equal mixture of algebraic topology operator algebras and physics There is also a bit of algebraic geometry especially in the last chapter The reader is assumed to be somewhat familiar with at least one of these four subjects but not necessarily with all or even most of them The main objective of the book is to show how several seemingly disparate subjects are closely linked with one another and to give readers an overview of some areas of current research even if this means that not everything is covered systematically

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