

Table of Contents

Dedication	III
Acknowledgments	IV
Preface	V
1. Introduction: The Commutative Case	1
1.1 Introduction	1
1.2 Proof of Theorem 1.1.1	6
2. Equivariant K-Theory of C^*-Algebras	12
2.1 The Equivariant K-Theory of Spaces	13
2.2 The Definition of Equivariant K-Theory for Banach Algebras	15
2.3 Swan's Theorem	22
2.4 Equivariant K-Theory in Terms of Idempotents	28
2.5 Direct Limits	33
2.6 Julg's Theorem	38
2.7 The $R(G)$ -Module Structure on $K_0(C^*(G, A, \alpha))$	44
2.8 The Homology Theory K_*^G	51
2.9 The Equivariant K-Theory of Hereditary Subalgebras and Twisted Products	62
3. Introduction to Equivariant KK-Theory	68
3.1 Preliminaries	69
3.2 The Definition of $KK_G(A, B)$	72
3.3 Extendible Quasihomomorphisms	80
3.4 The Kasparov Product	90
3.5 The General Form of the Product. Stability and Periodicity	104
3.6 Exact Sequences and Relations with K-Theory	116
4. Basic Properties of K-Freeness	131
4.1 Actions Having Locally Discrete K-Theory	131
4.2 K-Free and Totally K-Free Actions	136
4.3 Twisted Products and Free Action on the Primitive Ideal Space	144
4.4 KK-Free Actions	151
4.5 $C(X)$ -Algebras and KK-Freeness	157
4.6 $C_0(X)$ -Algebras and Total K-Freeness	162

5. Subgroups	167
5.1 Restriction and Induction in K-Theory and KK-Theory	187
5.2 Actions Whose Restrictions to Cyclic Subgroups are K-Free	177
5.3 The Ideal Decomposition Lemma and the KK-Subgroup Theorem	182
6. Tensor Products	189
6.1 A Pairing in Equivariant K-Theory	191
6.2 The Künneth Formula: Some Special Cases	200
6.3 The Equivariant K-Theory of Crossed Products by $\mathbb{Z}$, $\mathbb{R}$, and F_n	209
6.4 The Künneth Formula: The General Case	215
6.5 The Categories N^C and N_{nuc}^C	221
6.6 K-Freeness of Actions on Tensor Products	229
7. K-Freeness, Saturation, and the Strong Connes Spectrum	236
7.1 Saturated Actions	237
7.2 Hereditary Saturation and the Strong Connes Spectrum	246
7.3 Some Properties of Subquotients of C^* -Algebras	251
7.4 The Main Theorems	257
7.5 The Existence of K-Visible C^* -Algebras	266
7.6 The K-Theory of the Fixed Point Algebra	270
8. Type I Algebras	275
8.1 Free Action on the Primitive Ideal Space	275
8.2 Actions of Cyclic Groups	279
8.3 The Relationship Between K-Freeness and Hereditary Saturation	282
9. AF Algebras	286
9.1 Elementary Properties of K-Free Actions on AF Algebras	287
9.2 Locally Representable Actions	292
9.3 Examples	299
9.4 The Main Theorem on K-Freeness of AF Actions	306
9.5 Proof of Lemma 9.4.3	309
9.6 Proof of Lemma 9.4.4	315
9.7 Equivariant KK-Theory of AF Algebras and Proof of Lemma 9.4.6	320
References	329
Author/Reference Index	335
Index of Notation	339
Subject Index	345