

## Contents

### HORST BEHNCKE

#### Topics in C\*- and von Neumann Algebras

1. Application of C*-Algebras to the Structure of Single Operators . . . . .	2
2. C*-Algebras with Completely Ordered Structure Space . . . . .	10
3. C*-Algebras with a Two Point Dual . . . . .	18
4. Nilpotent Elements in Banach Algebras . . . . .	20
5. Generation of W*-Algebras . . . . .	24
I. Introduction . . . . .	24
II. Generators of Properly Infinite W*-Algebras . . . . .	27
6. Density of Generators in Properly Infinite W*-Algebras . . . . .	42
7. Generators of W*-Algebras of Type $\text{II}_1$ . . . . .	47

### HERBERT HEYER

#### Infinitely Divisible Probability Measures on Compact Groups

Introduction . . . . .	56
I. Preliminaries . . . . .	58
§1. Sets of Measures on a Locally Compact Group . . . . .	58
§2. Fourier Transforms of Bounded Measures . . . . .	66
II. Generations of Probability Semigroups . . . . .	72
§3. Convolution and Probability Semigroups . . . . .	72
§4. Hunt's Theorem . . . . .	81
III. Infinitely Divisible Measures . . . . .	116
§5. Embedding Theorem . . . . .	116
§6. Lévy-Khintchin Formulae . . . . .	141
IV. Poisson Measures . . . . .	153
§7. Characterization Theorem . . . . .	153
§8. Denseness Theorems . . . . .	168
V. Gauss Measures . . . . .	174
§9. Existence in the Abelian Case . . . . .	174
§10. General Definition and Existence . . . . .	197
VI. Central Limit Problem . . . . .	209
§11. Generation of Gauss Measures . . . . .	209
§12. Convergence to a Gauss Measure . . . . .	224

Appendix: Algebraic Versions of the Embedding and Poisson Characterization Theorems . . . . .	232
Bibliographical Comments . . . . .	236

HORST LEPTIN

<u>Darstellung verallgemeinerter <math>L^1</math>-Algebren II</u> . . . . .	251
---	-----

J. R. RINGROSELectures on the Trace in a Finite von Neumann Algebra

1. Auxiliary Results on Linear Spaces . . . . .	313
2. The Linear Space $B(H)$ . . . . .	319
3. The * Algebra $B(H)$ . . . . .	326
4. Complete Additivity and Ultraweak Continuity . . . . .	334
5. The Center-Valued Trace . . . . .	345

J. R. RINGROSECohomology of Operator Algebras

1. Cohomology of Banach Algebras . . . . .	359
2. Some Cohomological Examples . . . . .	363
3. The Derivation Theorem for von Neumann Algebras . . . . .	375
4. Adjustment of Cocycles by Averaging Techniques . . . . .	386
5. An Extension Theorem for Multilinear Mappings . . . . .	398
6. Normal Cohomology of Operator Algebras . . . . .	404
7. Norm Continuous Cohomology with Coefficients in a Dual Normal Module	420
8. Extended Cobounding . . . . .	423

TEISHIRO SAITOGenerations of von Neumann Algebras

Introduction . . . . .	436
§0. Notations and Terminology . . . . .	438
§1. Preliminaries-Generation and Separability . . . . .	440
§2. Von Neumann Algebras with a Single Generator . . . . .	446
§3. Generation of the von Neumann Algebra $M_2(\alpha)$ . . . . .	455
§4. Generation of von Neumann Algebras Having Property (*) . . . . .	468
§5. Generators of Properly Infinite von Neumann Algebras . . . . .	480

§6. Algebraic Generation of von Neumann Algebras . . . . .	502
§7. Linear Span of von Neumann Algebras . . . . .	510
Appendix: Von Neumann Algebras Having Property (*) (Matrix Algebras) .	526

TEISHIRO SAITOHyponormal Operators and Related Topics

Introduction . . . . .	534
§1. Terminology and Prerequisites . . . . .	537
§2. Dilation of Operators and Spectral Sets . . . . .	550
§3. Boundary Spectra of Operators Satisfying of Growth Condition . . .	567
§4. Normality Conditions on Hyponormal Operators and Andô's Theorem .	581
§5. Characterizations of Convexoid Operators . . . . .	600
§6. Tensor Products of Operators . . . . .	621
§7. A Decomposition Theorem for Operators and von Neumann Algebra Generation . . . . .	634
§8. Miscellaneous Results . . . . .	655

MASAMICHI TAKESAKIDuality and von Neumann Algebras

Introduction . . . . .	666
Preliminaries . . . . .	670
1. Hopf-von Neumann Algebras . . . . .	674
2. Examples . . . . .	677
3. The Basic Ideal $\alpha$ and the Modular Operator $\Delta$ . . . . .	682
4. The Fundamental Unitary Operator $W$ . . . . .	686
5. The Convolution . . . . .	697
6. The Regular Representation of $L^1(\tau)$ and the Modular Hilbert Bigebra $\alpha$ . . . . .	701
7. The Dual Involutive Hopf-von Neumann Algebra . . . . .	710
8. The Regular Representation of $L^1(\varphi)$ . . . . .	727
9. Duality . . . . .	735
10. Group Algebras . . . . .	749
11. Duality Theorem for Locally Compact Groups . . . . .	762
Appendix . . . . .	780