

## Contents

Preface	vii
Free Brownian Motion, Free Stochastic Calculus and Random Matrices PHILIPPE BIANE	1
Large $N$ Quantum Field Theory and Matrix Models MICHAEL R. DOUGLAS	21
Free Products of Finite Dimensional and Other von Neumann Algebras With Respect to Non-tracial States KENNETH J. DYKEMA	41
Amalgamated Free Product $C^*$ -Algebras and KK-Theory EMMANUEL GERMAIN	89
Connexion Coefficients for the Symmetric Group, Free Products in Operator Algebras and Random Matrices IAN P. GOULDEN and DAVID M. JACKSON	105
On Voiculescu's $R$ - and $S$ -transforms for Free Non-Commuting Random Variables UFFE HAAGERUP	127
$R$ -Diagonal Pairs - a Common Approach to Haar Unitaries and Circular Elements ALEXANDRU NICA and ROLAND SPEICHER	149
A Class of $C^*$ -algebras Generalizing Both Cuntz-Krieger Algebras and Crossed Products by $\mathbb{Z}$ MICHAEL V. PIMSNER	189
An Invariant for Subfactors in the von Neumann Algebra of a Free Group FLORIN RĂDULESCU	213
Limit Distributions of Matrices with Bosonic and Fermionic Entries DIMITRI SHLYAKHTENKO	241

<i>R</i> -Transform of Certain Joint Distributions DIMITRI SHLYAKHTENKO	253
On Universal Products ROLAND SPEICHER	257
Boolean Convolution ROLAND SPEICHER and REZA WOROUDI	267
States and Shifts on Infinite Free Products of $C^*$ -algebras ERLING STØRMER	281
The Analogues of Entropy and of Fisher's Information Measure in Free Probability Theory, IV: Maximum Entropy and Freeness DAN VOICULESCU	293
Universal Correlation in Random Matrix Theory: A Brief Introduction for Mathematicians ANTHONY ZEE	303