

## SUBJECT INDEX

- Antisymmetric Fock space 80, 173  
 Approximation property 85, 232, 240, 250, 293–296, 301  
 Bidual 47, 48, 232, 267, 273, 303–315  
 Blecher–Paulsen factorization 384  
 Column Hilbert space 21–23, 95, 96, 172, 177, 341  
 Completely bounded 18  
 Complex conjugate 63  
 Complex interpolation 52, 106–107, 135–141, 147, 178, 270, 271  
 $C^*$ -norm 227  
 Cuntz algebra 175  
 Decomposable map 230, 261  
 Direct sum 51  
 Duality 40  
 Dvoretzky’s theorem 215  
 Exact 285–302, 321  
 Factorization 23, 92, 101, 317  
 Fermion 173–175  
 Fock space 173, 176, 205  
 Free group 155, 182, 183, 188, 214, 215, 325, 331  
 Free product 98–101, 160, 365  
 Gaussian random variable 145, 191, 203, 331, 455  
 Grothendieck’s theorem 316  
 Group  $C^*$ -algebra 148  
 Haagerup tensor product 86–108, 128, 390  
 Halmos similarity problem 407  
 Hankel matrix 165–171, 410, 414  
 Hilbertian operator space 122, 173  
 Homogeneous operator space 172, 216, 217  
 Infinite Haagerup tensor product 390  
 Injective 232, 267, 273, 355, 356–357  
 Intersection (of operator spaces) 55  
 Kazhdan’s property  $T$  328  
 Kirchberg’s conjecture 283  
 Kirchberg’s theorem 252, 261, 296–297  
 Local lifting property (LLP) 275  
 Local reflexivity 303–315  
 $L_p$ -space 138, 191  
 Maximal tensor product (of  $C^*$ -algebra) 149, 227  
 Maximal tensor product (of non-self-adjoint operator algebra) 366  
 Maximal operator space structure on a Banach space 71, 323  
 Minimal operator space structure on a Banach space 71, 321, 323  
 Minimal tensor product 28  
 Multilinear factorization 92  
 Multiplier 27, 151–153, 181  
 Nuclear 231, 232, 250, 269, 273, 296  
 OLLP 277  
 Operator Hilbert space 122–147  
 Opposite 64  
 Perturbation 68  
 Point of continuity 339  
 Projective 359  
 Projective tensor product 81, 181  
 Properties  $C$ ,  $C'$ , and  $C''$  309–313  
 Property  $T$  328  
 Quantization 65  
 Quotient by a subspace 42  
 Quotient by an ideal 43  
 Quotient of WEP (QWEP) 274, 283  
 Rademacher functions 192  
 Ramanujan graph 327  
 Random matrix 203, 215, 331, 332, 455  
 Reduced  $C^*$ -algebra 149, 183  
 Row Hilbert space 21–23, 95–96, 172, 177, 341  
 Ruan’s theorem 35  
 Schur multiplier 27, 151–153  
 Semi-circular system 215  
 Similarity problem 396, 407  
 Spin system 76, 80, 173, 321, 413  
 Sum (of operator spaces) 55  
 Symmetrized Haagerup tensor product 102  
 Sz.-Nagy–Halmos similarity problem 407

478

*Introduction to Operator Space Theory*

Ultraproduct 59, 210

Unitization of an operator space 163

Universal 67

Vector-valued  $L_p$ -spaces 140, 180

Von Neumann algebra 47

Weak expectation property (WEP)

267, 283

## NOTATION INDEX

- $A(D)$  (disc algebra) 380, 407  
 $A_1 * A_2$  (free product) 98  
 $A_1 \dot{*} A_2$  (unital free product) 98  
 $C^*(G)$  (full  $C^*$ -algebra) 148  
 $C_\lambda^*(G)$  (reduced  $C^*$ -algebra) 149  
 $C^*\langle E \rangle$  (universal  $C^*$ -algebra of  $E$ ) 160  
 $C_u^*\langle E \rangle$  (universal unital  $C^*$ -algebra of  $E$ ) 160  
 $C_n, C$  (column Hilbert spaces) 21  
 $CB(E, F)$  (space of c.b. maps from  $E$  to  $F$ ) 19  
 $d(A)$  (similarity degree of  $A$ ) 403  
 $d(E, F)$  (Banach-Mazur distance) 334  
 $d_{cb}(E, F)$  (c.b. version of Banach-Mazur distance, or “c.b. distance”) 20  
 $d_f(E)$  (infimum of c.b. distance of  $E$  to a subspace of  $C^*(\mathbb{F}_\infty)$ ) 345  
 $d_{SX}(E)$  (infimum of c.b. distance of  $E$  to a subspace of  $X$ ) 8  
 $d_{SK}(E)$  (infimum of c.b. distance of  $E$  to a subspace of  $\mathcal{K}$ ) 286, 342  
 $\delta(n)$  343  
 $\delta$  (logarithm of  $d$ ) 334  
 $\delta_{cb}$  (logarithm of  $d_{cb}$ ) 335  
 $\oplus$  (direct sum, “block diagonal” or “in  $\ell_\infty$  sense”) 51  
 $\oplus_1$  (direct sum in  $\ell_1$  sense) 52  
 $\oplus_p$  (direct sum in  $\ell_p$  sense) 54  
 $D(G)$  (diagonal operators on  $\ell_2(G)$ ) 297  
 $E_U^n$  182, 336  
 $E_\lambda^n$  183  
 $E \otimes F$  (algebraic tensor product) 1, 28  
 $E \otimes_{\min} F$  (minimal tensor product) 1, 28  
 $E \otimes_h F$  (Haagerup tensor product) 87  
 $E \otimes_\mu F$  (symmetrized Haagerup tensor product) 102  
 $E \otimes^\wedge F$  (o.s. projective tensor product) 81  
 $\tilde{E}$  (unitization) 163  
 $(E_0, E_1)_\theta$  (complex interpolation space) 53  
 $E^*$  40  
 $\Phi(I), \Phi_n$  (“Fermionic” Hilbertian operator space) 173  
 $H \otimes_2 K$  (Hilbertian tensor product) 1  
 $\mathcal{K}$  2  
 $\ell(A)$  (length of  $A$ ) 401  
 $\lambda_G$  (left regular representation on  $G$ ) 148  
 $\lambda(n)$  352  
 $\lambda(X)$  134, 355  
 $\ell_\infty^n$  78  
 $\ell_1^n$  78  
 $\min(E), \min(\ell_2^n)$  71, 77  
 $\max(E), \max(\ell_2^n)$  71, 77  
 $M_*$  (predual of  $M$ ) 47, 305  
 $M \overline{\otimes} N$  (tensor product in von Neumann sense) 49  
 $M_n$  ( $n \times n$  matrices with complex entries) 12  
 $M_n(E)$  ( $n \times n$  matrices with entries in  $E$ ) 2, 18  
 $M_\varphi$  (Schur multiplier) 151–153  
 $\|\cdot\|_{cb}$  (c.b. norm) 19  
 $\|\cdot\|_{HS}$  (Hilbert-Schmidt norm) 21  
 $OA_u(E)$  113  
 $OH, OH_n$  (operator Hilbert space) 5, 123  
 $OS_n$  (set of  $n$ -dimensional operator spaces) 335  
 $\Pi_{i \in I} E_i / \mathcal{U}$  (ultraproduct) 59  
 $\pi_1 * \pi_2$  (“free product” of morphisms) 98  
 $\pi_1 \dot{*} \pi_2$  (“free product” of unital morphisms) 98  
 $R_n, R$  (row Hilbert spaces) 21  
 $R + C$  186, 194  
 $R \cap C$  184  
 $\left(\bigotimes_{j \in I} E_j\right)_h$  (infinite Haagerup Tensor Product)  
 $S_p$  (Schatten  $p$ -class) 140  
 $T_\Gamma$  411  
 $U_G$  (universal representation on  $G$ ) 148  
 $UC^*(G)$  297