

CONTENTS

**Preface** . . . . . 1

**Chapter 1. Preliminaries** . . . . . 4

**Chapter 2. The James space  $J$**  . . . . . 11

    2.a Definition and fundamental properties of  $J$  . . . . . 12

    2.b Finite representability . . . . . 17

    2.c Complemented subspaces of  $J$  and the space  $\tilde{J}$  . . . . . 29

    2.d Basic sequences and the primarity of  $J$  . . . . . 44

    2.e Isometries of the space  $J$  . . . . . 61

    2.f  $J$  as a conjugate space . . . . . 72

    2.g The dual of the James space . . . . . 83

    2.h The Banach-Saks properties and the spreading models of  $J$   
 and  $J^*$  . . . . . 92

    2.i  $J^*$  has cotype 2 . . . . . 102

    2.j Appendix:  $\pi_\lambda$ -spaces, bounded approximation property  
 and finite dimensional decompositions . . . . . 116

    2.k Appendix:  $\text{Lip}_\alpha([0,1],X)$  and  $L_p(X)$  . . . . . 126

        (i) An isomorphism between  $\ell_\infty(x)$  and  $\text{Lip}_\alpha([0,1],X)$  . . . . . 126

        (ii) About the space  $L_p(X)$  of Bochner integrable functions . . . . . 129

**Chapter 3. The James tree space  $JT$**  . . . . . 134

    3.a The space  $JT$  . . . . . 134

    3.b The fixed point property . . . . . 161

    3.c The conjugates of  $JT$  . . . . . 167

    3.d The norms of  $JT$  and  $JT^*$  have the Kadec-Klee property . . . . . 182

|  |     |
|--|-----|
| <b>Chapter 4. What else is there about J and JT?</b> . . . . . | 214 |
| 4.a More about J . . . . .                                     | 214 |
| 4.b More about JT . . . . .                                    | 217 |
| 4.c Generalizations of J . . . . .                             | 220 |
| 4.d Generalizations of JT . . . . .                            | 227 |
| <b>Chapter 5. Other pathological spaces</b> . . . . .          | 231 |
| <b>References</b> . . . . .                                    | 237 |
| <b>Index of citations</b> . . . . .                            | 245 |
| <b>List of special symbols</b> . . . . .                       | 249 |
| <b>Subject index</b> . . . . .                                 | 252 |