

Graduate Studies in Mathematics

Volume 18

Discovering Modern Set Theory. II

Set-Theoretic Tools for
Every Mathematician

Winfried Just
Martin Weese



American Mathematical Society

Contents

Preface	ix
Notation	xi
Chapter 13. Filters and Ideals in Partial Orders	1
13.1. The general concept of a filter	1
13.2. Ultraproducts	8
13.3. A first look at Boolean algebras	12
Mathographical Remarks	24
Chapter 14. Trees	27
Mathographical Remarks	48
Chapter 15. A Little Ramsey Theory	49
Mathographical Remarks	65
Chapter 16. The Δ -System Lemma	67
Chapter 17. Applications of the Continuum Hypothesis	71
17.1. Applications to Lebesgue measure and Baire category	71
17.2. Miscellaneous applications of CH	79
Mathographical Remarks	85
Chapter 18. From the Rasiowa-Sikorski Lemma to Martin's Axiom	87
Mathographical Remarks	94
Chapter 19. Martin's Axiom	95
19.1. MA essentials	95
19.2. MA and cardinal invariants of the continuum	102
19.3. Ultrafilters on ω	110
Mathographical Remarks	116
Chapter 20. Hausdorff Gaps	117
Mathographical Remarks	122
Chapter 21. Closed Unbounded Sets and Stationary Sets	123
21.1. Closed unbounded and stationary sets of ordinals	123
21.2. Closed unbounded and stationary subsets of $[X]^{<\kappa}$	131
Chapter 22. The \diamond -principle	139
Mathographical Remarks	146

Chapter 23. Measurable Cardinals	147
Mathographical Remarks	157
Chapter 24. Elementary Submodels	159
24.1. Elementary facts about elementary submodels	159
24.2. Applications of elementary submodels in set theory	167
Mathographical Remarks	185
Chapter 25. Boolean Algebras	187
Mathographical Remark	205
Chapter 26. Appendix: Some General Topology	207
Index	217
Index of Symbols	223