## Contents

Foreword	vii
Preface	ix
Chapter 1. The $L^1$ Fourier Transform	1
Chapter 2. The Schwartz Space	7
Appendix: Pointwise Poincaré inequalities	11
Chapter 3. Fourier Inversion and the Plancherel Theorem	15
Corollaries of the inversion theorem	18
Chapter 4. Some Specifics, and $L^p$ for $p < 2$	23
Chapter 5. The Uncertainty Principle	31
Chapter 6. The Stationary Phase Method	37
Chapter 7. The Restriction Problem	45
Chapter 8. Hausdorff Measures	57
Chapter 9. Sets with Maximal Fourier Dimension and Distance Sets	67
Chapter 10. The Kakeya Problem	79
Bibliography	89
Chapter 11. Recent Work Connected with the Kakeya Problem	91
List of notation	93
11.1. The two dimensional case	93
11.2. The higher dimensional case	101
11.3. Circles	105
11.4. Oscillatory integrals and Kakeya	117
Bibliography	129
Historical Notes	133
Ribliography	137