## HARMONIC ANALYSIS AS THE EXPLOITATION OF SYMMETRY-A HISTORICAL SURVEY

## BY GEORGE W. MACKEY

## CONTENTS

Preface

- 1. Introduction
- 2. The Characters of Finite Groups and the Connection with Fourier Analysis
- 3. Probability Theory Before the Twentieth Century
- 4. The Method of Generating Functions in Probability Theory
- 5. Number Theory Before 1801
- 6. The Work of Gauss and Dirichlet and the Introduction of Characters and Harmonic Analysis into Number Theory
- 7. Mathematical Physics Before 1807
- 8. The Work of Fourier, Poisson, and Cauchy, and Early Applications of Harmonic Analysis to Physics
- 9. Harmonic Analysis, Solutions by Definite Integrals, and the Theory of Functions of a Complex Variable
- 10. Elliptic Functions and Early Applications of the Theory of Functions of a Complex Variable to Number Theory
- 11. The Emergence of the Group Concept
- 12. Introduction to Sections 13-16
- 13. Thermodynamics, Atoms, Statistical Mechanics, and the Old Quantum Theory
- 14. The Lebesgue Integral, Integral Equations, and the Development of Real and Abstract Analysis
- 15. Group Representations and Their Characters
- 16. Group Representations in Hilbert Space and the Discovery of Quantum Mechanics
- 17. The Development of the Theory of Unitary Group Representations Between 1930 and 1945

Copyright 1978 by Rice University

Reprinted from *Rice University Studies* (Volume 64, Numbers 2 and 3, Spring-Summer 1978, pages 73 to 228), with the permission of the publisher.

<sup>1980</sup> Mathematics Subject Classification. Primary 01, 10, 12, 20, 22, 26, 28, 30, 35, 40, 42, 43, 45, 46, 47, 60, 62, 70, 76, 78, 80, 81, 82.