



Homology and Feynman Integrals

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232 Pages. \$12.50/\$10.00 Prepaid

This monograph and collection of reprints treats the application of homology theory to the analytic structures of Feynman and unitarity integrals. Study of the analyticity of Feynman integrals by classical methods is summarized, and homology theory is described.

CONTENTS: *Singularities*. Landau Surface. Pinch in Momentum Space. Discontinuity and Unitarity Integrals. Nodes and Cusps. Non-Landau Singularities. Abelian Integrals and Topology. *Homology*. Simplicial Complexes. Chains, Cycles, and Boundaries. The Homology Group. The Relative Homology Group. Chain-Mapping and Induced Homomorphism. Exact Sequences. The Exact Homology Sequence. *Integrals*. Compact and Closed Homologies. The Coboundary Homomorphism. The Vanishing Class. The Kronecker Index. The Picard-Lefschetz Theorem. Example: A Unitarity Integral. Example: An Effective Intersection. *Discontinuities*. Differential Forms. The Residue Formula. The Discontinuity Formula. *More Mathematics*. Homotopy. Manifolds and Varieties. Cohomology. Fiber Bundle. Spectral Sequences. Categories and Functors. Sheaves. *Some Results*. The Ambient Isotopy Theorem. Compactification. The Decomposition Theorem. Concluding Remarks. References. Reprints. Index.

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tions, solubility, thermodynamic properties, radioactive, magnetic and electrical properties of rocks and minerals, and atomic constants (1961).

The eight sponsoring industrial concerns and the Geological Society are to be commended for this useful and attractively printed handbook.

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From first principles

THE PHYSICAL PRINCIPLES OF MAGNETISM. By Allan H. Morrish. 680 pp. Wiley, New York, 1965. \$16.50

by Robert L. Weber

A scientist or engineer who desires an integrated knowledge of magnetism will be grateful for Morrish's extensive, modern treatment that starts from first principles. The author, now at the University of Manitoba, states that the text evolved from solid-state courses offered at the University of Minnesota and from a three-quarter graduate course in magnetism. First courses in solid-state physics and quantum physics are assumed as prerequisites.

Magnetic phenomena are introduced from an experimental point of view and interpreted in quantum-mechanical theories. More than half the book is devoted to strongly coupled dipole systems, where molecular field theory is stressed. The author's association with the *Magnetic Materials Digest* is reflected in his extensive references to the literature. One is struck by the number of new names cited in the work of the last two decades.

Diamagnetism, paramagnetism, ferromagnetism, ferrimagnetism and antiferromagnetism are covered in a way that unifies material from physics, chemistry, metallurgy and engineering. Work on alloys and superconductivity is not emphasized. Such topics as magnetohydrodynamics, group-theoretical analysis and the magnetoelectric effect are omitted.

Problem sets and bibliographies appear at the end of the chapter. A

short appendix includes a convenient conversion table for Gaussian and rationalized mks units, demagnetization factors, and outer electronic configurations for the elements.

Semiconductor electronics series

INTRODUCTION TO SEMICONDUCTOR PHYSICS. By R. B. Adler, A. C. Smith, R. L. Longini. 247 pp. Wiley, New York, 1964. Cloth \$4.50, paper \$2.65

PHYSICAL ELECTRONICS AND CIRCUIT MODELS OF TRANSISTORS. By Paul E. Gray, David DeWitt, A. R. Boothroyd, James F. Gibbons. 262 pp. Wiley, New York, 1964. Cloth \$4.50, paper \$2.65

by H. J. Hagger

In 1960 the Semiconductor Electronics Education Committee (SEEC) undertook the preparation of a course in semiconductor electronics for use in universities at the third- or fourth-year undergraduate level. Seven books on semiconductor electronics are planned and shall—before publication—be produced in one or more preliminary editions for teaching trials at colleges or in industrial training courses. The volumes 1 and 2 of this series of 7 books have been published to date.

The first volume, *Introduction to Semiconductor Physics*, is a very general treatment of the fundamentals and shows little reference to specific semiconductor devices. The content of the book is divided into four main parts. The first chapter deals with the valence-bond model of a semiconductor. It discusses the intrinsic conduction of semiconductors, the role of impurities and the conduction process and finishes with the description of minority-carrier injection and recombination. Chapter 2 is a parallel and comparative treatment of the subject dealt with in chapter 1 by explaining the energy-band model approach. For these two chapters the authors are to be congratulated for they describe complicated relations in semiconductor materials with clarity and in a well balanced manner. Chapter 3 deals with the equilibrium distribution of electrons in the bands discussing quantum statistics and transition probabilities related to semiconductors. The last chapter describes none-