

Inverse Scattering Theory

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Inverse Schrödinger Scattering in Three Dimensions

1989. X, 170 pp. 1 fig. (Texts and Monographs in Physics) Hardcover DM 68,- ISBN 3-540-50563-6

This book specifically explores the inverse Schrödinger scattering problem in three dimensions with a potential that is without any assumed symmetry properties. It covers most of the known methods for the exact solution of this problem, including detailed proofs of most of the needed theorems. The solutions of the three-dimensional inverse-scattering problem found during the last twenty years are presented together for the first time in coherent, self-contained, and detailed manner. This book combines the known results published previously in research papers only, corrects some errors, closes some blind alleys in previous developments, and also contains a number of new results.

K. Chadan, Université de Paris-Sud, Orsay; P. C. Sabatier,
Université des Sciences et Techniques du Languedoc, Montpellier

Inverse Problems in Quantum Scattering Theory

With a Foreword by R. G. Newton

2nd rev. and expanded ed. 1989. XXXI, 499 pp. 24 figs. (Texts and Monographs in Physics)
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The physical importance of inverse problems in quantum scattering theory is clear since all the information we can obtain on nuclear, particle, and subparticle physics is gathered from scattering experiments. Exact and approximate methods of investigating scattering theory, inverse radial problems at fixed energy, inverse one-dimensional problems, inverse three-dimensional problems, and construction of the scattering amplitude from the cross section are presented. The methods often apply to other fields, e.g. applied mathematics and geophysics. The book will therefore be of interest to theoretical and mathematical physicists, nuclear particle physicists, and chemical physicists.

For the second edition the chapters on one-dimensional and three-dimensional scattering problems have been rewritten and considerably expanded. Furthermore, two new chapters on spectral problems and on numerical aspects have been added; in the sections on classical methods the comments and reference have been updated.

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