

**Colton, David; Kress, Rainer**

**Inverse acoustic and electromagnetic scattering theory. 3rd ed.** (English) Zbl 1266.35121  
*Applied Mathematical Sciences* 93. New York, NY: Springer (ISBN 978-1-4614-4941-6/hbk; 978-1-4614-4942-3/ebook). xiv, 405 p. (2013).

The first and second editions of this well-known book were published in 1992 and 1998 (for a review cf. [[Zbl 0760.35053](#)] and [[Zbl 0893.35138](#)]) and soon became a classic standard reference for anyone concerned with the mathematical and numerical analysis of inverse wave scattering problems. This third edition includes important new developments in the field during the last 15 years, and the additions to the previous edition can be described best by quoting from the authors' preface:

“In order to bring our book up to date, considerable changes have been made to the second edition. In particular, new sections have been added on the linear sampling and factorization methods for solving the inverse scattering problem as well as expanded treatments of iteration methods and uniqueness theorems for the inverse obstacle problem. These additions have also required us to expand our presentation on both transmission eigenvalues and boundary integral equations in Sobolev spaces.”

“We hope that this new edition of our book will continue to serve readers who are already in the field of inverse scattering theory as well as to attract newcomers to this beautiful area of applied mathematics.”

Reviewer: [Johannes Elschner \(Berlin\)](#)

**MSC:**

- [35P25](#) Scattering theory for PDEs
- [35J05](#) Laplace operator, Helmholtz equation (reduced wave equation), Poisson equation
- [35R30](#) Inverse problems for PDEs
- [45A05](#) Linear integral equations
- [65M30](#) Numerical methods for ill-posed problems for initial value and initial-boundary value problems involving PDEs
- [78A45](#) Diffraction, scattering

Cited in <b>1</b> Review Cited in <b>308</b> Documents
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**Keywords:**

[Helmholtz equation](#); [Maxwell equations](#); [inverse obstacle problem](#); [inverse medium problem](#); [uniqueness](#); [reconstruction methods](#)

**Full Text:** [DOI](#)