



# Introduction to Ground Penetrating Radar: Inverse Scattering and Data Processing (IEEE Press Series on Electromagnetic Wave Theory)

By Raffaele Persico



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**Introduction to Ground Penetrating Radar: Inverse Scattering and Data Processing (IEEE Press Series on Electromagnetic Wave Theory)** By Raffaele Persico

**A real-world guide to practical applications of ground penetrating radar (GPR)**

The nondestructive nature of ground penetrating radar makes it an important and popular method of subsurface imaging, but it is a highly specialized field, requiring a deep understanding of the underlying science for successful application. *Introduction to Ground Penetrating Radar: Inverse Scattering and Data Processing* provides experienced professionals with the background they need to ensure precise data collection and analysis.

Written to build upon the information presented in more general introductory volumes, the book discusses the fundamental mathematical, physical, and engineering principles upon which GPR is built. Real-world examples and field data provide readers an accurate view of day-to-day GPR use. Topics include:

- 2D scattering for dielectric and magnetic targets
- 3D scattering equations and migration algorithms
- Host medium characterization and diffraction tomography
- Time and frequency steps in GPR data sampling
- The Born approximation and the singular value decomposition

The six appendices contain the mathematical proofs of all examples discussed throughout the book. *Introduction to Ground Penetrating Radar: Inverse Scattering and Data Processing* is a comprehensive resource that will prove invaluable in the field.



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### Editorial Review

About the Author

**RAFFAELE PERSICO, PhD**, received his degree in Electronic Engineering from the University of Napoli Federico II and his PhD in Information Engineering from the Second University of Napoli. He was a Research Scientist at the Consortium CO.RI.S.T.A., a member of the Institute of Electromagnetic Sensing of the Environment (IREA-CNR), and a member of the Institute for Archaeological and Monumental Heritage (IBAM-CNR). He chaired the 13th International Conference on Ground Penetrating Radar.

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