1. Record Nr. UNINA9910967653503321

Autore	Davidson P. A (Peter Alan), <1957->
Titolo	An introduction to electrodynamics / / P.A. Davidson
Pubbl/distr/stampa	Oxford : , : Oxford University Press, , 2019 ©2019
ISBN	9780192519108 0192519107 9780198798125 0198798121 9780198798132 019879813X
Edizione	[First edition.]
Descrizione fisica	1 online resource (xxii, 582 pages) : illustrations (some color)
Disciplina	537.6
Soggetti	Electrodynamics Quantum electrodynamics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1. Vector Calculus -- 2. The Physical Signatures of Three Important Partial Differential Equations -- 3. A Bird's Eye View of Electromagnetism -- 4. The Foundations of Electrostatics -- 5. Solving for Electrostatic Fields, the Multipole Expansion and Electrostatic Energy -- 6. Dielectrics -- 7. Magnetostatics I: The Magnetic Field, Ampere's Law and the Biot-Savart Law -- 8. 8 Magnetostatics II: Dipoles, Force Distributions and Energy -- 9. Magnetic Fields in Matter -- 10. Faraday's Law of Electromagnetic Induction -- 11. Quasi-Static Magnetic Fields: Magnetic Energy and Inductance -- 12. Transient and AC Circuits -- 13. Static Versus Dynamic Fields: Maxwell's Equations -- 14. Confined Waves: Transmission Lines, Waveguides and Resonant Cavities -- 15. Maxwell's Equations in Free Space I: the Propagation of Waves -- 16. Maxwell's Equations in Free Space II: Radiation -- 17. Maxwell's Equations in Free Space III: the Fields of Moving Charges -- 18. Maxwell's Equations in Dielectric and Magnetic Materials -- 19. Plane Waves in Stationary Dielectrics and Conductors -- 20. Magnetoydrodynamics I: Governing Equations and Kinematic Theorems

	-- 21. Magnetohydrodynamics II: Fusion Plasmas, Alfven Waves, Planetary Dynamos and Stellar Magnetism -- 22. An Introduction to Special Relativity -- 23. Electromagnetism and Special Relativity.
Sommario/riassunto	"An Introduction to Electrodynamics provides an excellent foundation for those undertaking a course on electrodynamics, providing an in-depth yet accessible treatment of topics covered in most undergraduate courses, but goes one step further to introduce advanced topics in applied physics, such as fusions plasmas, stellar magnetism and planetary dynamos. Some of the central ideas behind electromagnetic waves, such as three-dimensional wave propagation and retarded potentials, are first explored in the introductory background chapters and explained in the much simpler context of acoustic waves. The inclusion of two chapters on magnetohydrodynamics provides the opportunity to illustrate the basic theory of electromagnetism with a wide variety of physical applications of current interest. Davidson places great emphasis on the pedagogical development of ideas throughout the text, and includes many detailed illustrations and well-chosen exercises to complement the material and encourage student development."--Back cover.