

1. Record Nr.	UNINA9910780054003321
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Titolo	Classical theory of gauge fields [[electronic resource]] / Valery Rubakov ; translated by Stephen S. Wilson
Pubbl/distr/stampa	Princeton, N.J., : Princeton University Press, c2002
ISBN	1-282-15923-2 9786612159237 1-4008-2509-1 1-4008-1458-8
Edizione	[Course Book]
Descrizione fisica	1 online resource (457 p.)
Classificazione	UO 4060
Altri autori (Persone)	WilsonStephen S
Disciplina	530.14/35
Soggetti	Gauge fields (Physics)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references (p. 429-439) and index.
Nota di contenuto	Front matter -- Contents -- Preface -- Part I -- Chapter 1. Gauge Principle In Electrodynamics -- Chapter 2. Scalar And Vector Fields -- Chapter 3. Elements of the Theory of Lie Groups and Algebras -- Chapter 4. Non-Abelian Gauge Fields -- Chapter 5. Spontaneous Breaking of Global Symmetry -- Chapter 6. Higgs Mechanism -- Supplementary Problems for Part I -- Part II -- Chapter 7. The Simplest Topological Solitons -- Chapter 8. Elements of Homotopy Theory -- Chapter 9. Magnetic Monopoles -- Chapter 10. Non-Topological Solitons -- Chapter 11. Tunneling and Euclidean Classical Solutions in Quantum Mechanics -- Chapter 12. Decay of a False Vacuum in Scalar Field Theory -- Chapter 13. Instantons and Sphalerons in Gauge Theories -- Supplementary Problems for Part II -- Part III -- Chapter 14. Fermions in Background Fields -- Chapter 15. Fermions and Topological External Fields in Two-dimensional Models -- Chapter 16. Fermions in Background Fields of Solitons and Strings in Four-Dimensional Space-Time -- Chapter 17. Non-Conservation of Fermion Quantum Numbers in Four-dimensional Non-Abelian Theories -- Supplementary Problems for Part III -- Appendix Classical Solutions and the Functional Integral -- Bibliography -- Index
Sommario/riassunto	Based on a highly regarded lecture course at Moscow State University,

this is a clear and systematic introduction to gauge field theory. It is unique in providing the means to master gauge field theory prior to the advanced study of quantum mechanics. Though gauge field theory is typically included in courses on quantum field theory, many of its ideas and results can be understood at the classical or semi-classical level. Accordingly, this book is organized so that its early chapters require no special knowledge of quantum mechanics. Aspects of gauge field theory relying on quantum mechanics are introduced only later and in a graduated fashion--making the text ideal for students studying gauge field theory and quantum mechanics simultaneously. The book begins with the basic concepts on which gauge field theory is built. It introduces gauge-invariant Lagrangians and describes the spectra of linear perturbations, including perturbations above nontrivial ground states. The second part focuses on the construction and interpretation of classical solutions that exist entirely due to the nonlinearity of field equations: solitons, bounces, instantons, and sphalerons. The third section considers some of the interesting effects that appear due to interactions of fermions with topological scalar and gauge fields. Mathematical digressions and numerous problems are included throughout. An appendix sketches the role of instantons as saddle points of Euclidean functional integral and related topics. Perfectly suited as an advanced undergraduate or beginning graduate text, this book is an excellent starting point for anyone seeking to understand gauge fields.
