

1. Record Nr.	UNINA9910450877003321
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Titolo	Selfdual gauge field vortices [[electronic resource] ] : an analytical approach // Gabriella Tarantello
Pubbl/distr/stampa	Boston, : Birkhauser, 2008
ISBN	1-281-39740-7 9786611397401 0-8176-4608-6
Edizione	[1st ed. 2008.]
Descrizione fisica	1 online resource (336 p.)
Collana	Progress in nonlinear differential equations and their applications ; ; v. 72
Disciplina	515.355 515/.3533 530.1435
Soggetti	Gauge fields (Physics) Differential equations, Nonlinear Electronic books.
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 and index.
Nota di contenuto	Selfdual Gauge Field Theories -- Elliptic Problems in the Study of Selfdual Vortex Configurations -- Planar Selfdual Chern–Simons Vortices -- Periodic Selfdual Chern–Simons Vortices -- The Analysis of Liouville-Type Equations With Singular Sources -- Mean Field Equations of Liouville-Type -- Selfdual Electroweak Vortices and Strings.
Sommario/riassunto	In modern theoretical physics, gauge field theories are of great importance since they keep internal symmetries and account for phenomena such as spontaneous symmetry breaking, the quantum Hall effect, charge fractionalization, superconductivity and supergravity. This monograph discusses specific examples of gauge field theories that exhibit a selfdual structure. The author builds a foundation for gauge theory and selfdual vortices by introducing the basic mathematical language of the subject and formulating examples ranging from the well-known abelian–Higgs and Yang–Mills models to the Chern–Simons–Higgs theories (in both the abelian and non-abelian settings). Thereafter, the electroweak theory and self-gravitating

electroweak strings are also examined, followed by the study of the differential problems that have emerged from the analysis of selfdual vortex configurations; in this regard the author treats elliptic problems involving exponential non-linearities, also in relation to concentration-compactness principles and blow-up analysis. Many open questions still remain in the field and are examined in this comprehensive work in connection with Liouville-type equations and systems. The goal of this text is to form an understanding of selfdual solutions arising in a variety of physical contexts. *Selfdual Gauge Field Vortices: An Analytical Approach* is ideal for graduate students and researchers interested in partial differential equations and mathematical physics.

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