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Descrizione fisica	1 online resource (306 p.)
Collana	K & E series on knots and everything ; ; v. 33
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Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references (p. 271-284) and index.
Nota di contenuto	Contents ; Preface ; Part 1 In search of the "optimal embedding" of a knot ; Chapter 1 Introduction ; 1.1 Motivational problem ; 1.2 Notations and remarks ; Chapter 2 a-energy functional $E(a)$ ; 2.1 Renormalizations of electrostatic energy of charged knots 2.2 Renormalizations of $r$ - $a$ -modified electrostatic energy $E_a$ 2.3 Asymptotic behavior of $r$ - $a$ energy of polygonal knots ; 2.4 The self-repulsiveness of $E(a)$ ; Chapter 3 On $E(2)$ ; 3.1 Continuity ; 3.2 Behavior of $E(2)$ under "pull-tight" ; 3.3 Mobius invariance 3.4 The cosine formula for $E(2)$ 3.5 Existence of $E(2)$ minimizers ; 3.6 Average crossing number and finiteness of knot types ; 3.7 Gradient regularity of $E(2)$ minimizers and criterion of criticality ; 3.8 Unstable $E(2)$ -critical torus knots ; 3.9 Energy associated to a diagram 3.9.1 General framework 3.9.2 "X-energy" ; 3.10 Normal projection energies ; 3.11

Generalization to higher dimensions ;  
Chapter 4  $L_p$  norm energy with higher index  
; 4.1 Definition of  $(a, p)$ -energy functional for knots  $e_{ap}$   
; 4.2 Control of knots by  $E_{ap}$  ( $e_{ap}$ )  
4.3 Complete system of admissible solid tori and finiteness of knot  
types 4.4 Existence  
of  $E_{ap}$  minimizers ; 4.5 The circles minimize  
 $E_{ap}$  ; 4.6 Definition of  $a$ -energy polynomial for  
knots ; 4.7 Brylinski's beta function  
for knots ; 4.8 Other  $L_p$ -norm energies  
Chapter 5 Numerical experiments

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## Sommario/riassunto

Energy of knots is a theory that was introduced to create a "canonical configuration" of a knot - a beautiful knot which represents its knot type. This book introduces several kinds of energies, and studies the problem of whether or not there is a "canonical configuration" of a knot in each knot type. It also considers these problems in the context of conformal geometry. The energies presented in the book are defined geometrically. They measure the complexity of embeddings and have applications to physical knotting and unknotting through numerical experiments.   
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