

<<纽结与共形几何的能量ENERGY>>

图书基本信息

书名：<<纽结与共形几何的能量ENERGY OF KNOTS AND CONFORMAL GEOMETRY>>

13位ISBN编号：9789812383167

10位ISBN编号：9812383166

出版时间：2003-12

出版时间：World Scientific Pub Co Inc

作者：O'Hara, Jun

页数：288

版权说明：本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问：<http://www.tushu007.com>

## <<纽结与共形几何的能量ENERGY >>

### 内容概要

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 this 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.

<< 纽结与共形几何的能量 ENERGY >>

书籍目录

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  $\alpha$ -energy functional  $E(\alpha)$  2.1 Renormalizations of electrostatic  
 energy of charged knots ... 2.2 Renormalizations of  $r$ - $\alpha$ -modified electrostatic energy,  $E(\sim)$  .. 2.3  
 Asymptotic behavior of  $r$ - $\alpha$  energy of polygonal knots 2.4 The self-repulsiveness of  $E(\alpha)$  Chapter 3 On  $E(2)$   
 3.1 Continuity 3.2 Behavior of  $E(2)$  under "pull-tight" . 3.3 M5bius 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  $(\alpha, p)$ -energy functional for knots  $e_{\alpha, p}$  4.2 Control of knots by  $E_{\alpha, p}$  ( $e_{\alpha, p}$ )  
 4.3 Complete system of admissible solid tori and finiteness of knot types 4.4 Existence of  $E_{\alpha, p}$   
 minimizers 4.5 The circles minimize  $E_{\alpha, p}$  4.6 Definition of  $\alpha$ -energy polynomial for knots 4.7  
 Brylinski's beta function for knots 4.8 Other  $L^p$ -norm energies Chapter 5 Numerical experiments 5.1  
 Numerical experiments on  $E(2)$  5.2  $\alpha > 2$  cases. The limit as  $n$ -when  $\alpha > 3$  5.3 Table of approximate  
 minimum energies Chapter 6 Stereo pictures of  $E(2)$  minimizers Chapter 7 Energy of knots in a Riemannian  
 manifold 7.1 Definition of the unit density  $(\alpha, p)$ -energy  $E_{\alpha, p}$  7.2 Control of knots by  $E_{\alpha, p}$  7.3  
 Existence of energy minimizers 7.4 Examples : Energy of knots in  $S^3$  and  $H^3$  7.4.1 Energy of circles in  $S^3$   
 7.4.2 Energy of trefoils on Clifford tori in  $S^3$  7.4.3 Existence of  $E_{\alpha, p}$  minimizers 7.4.4 Energy of knots in  
 $H^3$  7.5 Other definitions 7.6 The existence of energy minimizers Chapter 8 Physical knot energies  
 8.1 Thickness and ropelength 8.2 Four thirds law 8.3 Osculating circles and osculating spheres ...  
 ...Part 2 Energy of knots from a conformal geometric viewpoint Appendix A Generalization of the Gauss formula  
 for the linking number Appendix B The 3-tuple map to the set of circles in  $S^3$  Appendix C Conformal moduli of a  
 solid torus Appendix D Kirchhoff elastica Appendix E Open problems and dreams Bibliography Index

版权说明

本站所提供下载的PDF图书仅提供预览和简介, 请支持正版图书。

更多资源请访问:<http://www.tushu007.com>