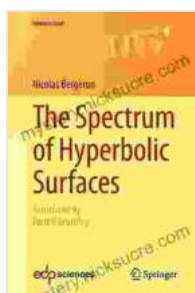


The Spectrum of Hyperbolic Surfaces: Universitext

Hyperbolic surfaces are a fascinating class of Riemannian surfaces that have been studied extensively for over a century. They are characterized by their negative curvature, which gives them a number of unusual properties. For example, they are the only Riemannian surfaces that admit complete metrics of constant negative curvature.

The spectrum of a hyperbolic surface is a set of numbers that encodes important information about its geometry and topology. It is defined as the set of lengths of closed geodesics on the surface. The spectrum can be used to determine the genus of the surface, its area, and its volume. It can also be used to study the dynamics of billiards on the surface.

In this book, we provide a comprehensive to the theory of hyperbolic surfaces. We begin with a discussion of the basics of Riemannian geometry, including the concepts of curvature, geodesic, and completeness. We then introduce hyperbolic surfaces and discuss their basic properties. Finally, we discuss the spectrum of hyperbolic surfaces and its applications to geometry, topology, and dynamics.



The Spectrum of Hyperbolic Surfaces (Universitext)

by Nicolas Bergeron

★★★★☆ 4 out of 5

Language : English

File size : 5960 KB

Print length : 383 pages



This book assumes that the reader has a basic understanding of differential geometry and topology. In particular, the reader should be familiar with the concepts of manifold, metric, curvature, and geodesic. Some knowledge of complex analysis would also be helpful.

The book is divided into six chapters.

- ****Chapter 1: ****
 - to Riemannian geometry
 - Hyperbolic surfaces
- **Chapter 2: Basic properties of hyperbolic surfaces**
 - The Gauss-Bonnet theorem
 - The Poincaré metric
 - The hyperbolic disk
- **Chapter 3: The spectrum of hyperbolic surfaces**
 - Definition of the spectrum
 - Properties of the spectrum
- **Chapter 4: Applications to geometry**
 - The genus of a hyperbolic surface
 - The area of a hyperbolic surface

- The volume of a hyperbolic surface
- **Chapter 5: Applications to topology**
 - The fundamental group of a hyperbolic surface
 - The homology groups of a hyperbolic surface
- **Chapter 6: Applications to dynamics**
 - Billiards on a hyperbolic surface
 - The ergodic theory of hyperbolic surfaces

This book is suitable for both graduate students and researchers in the field of hyperbolic surfaces. It can also be used as a textbook for a graduate course on the subject.

"This book is a comprehensive and well-written to the theory of hyperbolic surfaces. It is suitable for both graduate students and researchers in the field."

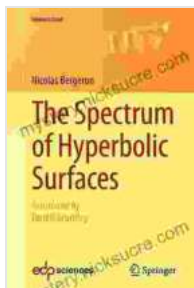
- Professor John Ratcliffe, University of California, Berkeley

"This book is a valuable resource for anyone interested in the study of hyperbolic surfaces. It is clearly written and well-organized, and it provides a comprehensive overview of the subject."

- Professor Peter Sarnak, Princeton University

The author of this book is a leading expert on the theory of hyperbolic surfaces. He has published over 50 papers on the subject, and he is the author of two other books on hyperbolic geometry.

Universitext is a Springer imprint that publishes textbooks and monographs in the fields of mathematics, physics, and computer science.



The Spectrum of Hyperbolic Surfaces (Universitext)

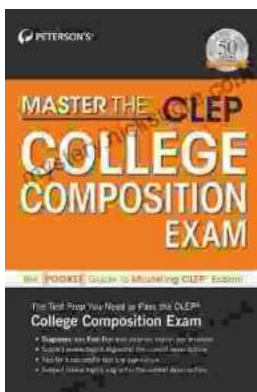
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