

<<微分几何>>

图书基本信息

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作者：希阿雷

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## 前言

The ISFMA-CIMPA School on "Differential Geometry: Theory and Applications" was held on 07 August - 18 August 2006, in the building of the Chinese-French Institute for Applied Mathematics ( ISFMA ), Fudan University, Shanghai, China. This school was jointly organized by the ISFMA and the CIMPA

( International Centre for Pure and Applied Mathematics ), Nice, France. About sixty participants from China, Hong Kong, France, Cambodia, India, Iran, Pakistan, Philippines, Romania, Russia, Sri-Lanka, Thailand, Turkey, Uzbekistan and Vietnam attended this highly successful event. The first objective of this school was to lay down in a self-contained and accessible manner the basic notions of differential geometry, such as the metric tensor, the Riemann curvature tensor, the fundamental forms of a surface, covariant derivatives, and the fundamental theorem of surface theory etc. Although this field is with good reasons often considered as a "classical" one, it has been recently "rejuvenated", thanks to the manifold applications where it plays an essential role. The second objective of this school was to present some of these applications, such as the theory of linearly and nonlinearly elastic shells, the implementation of numerical methods for shells, and mesh generation in finite element methods.

To fulfill these objectives, four series of lectures, each series comprising ten 50min-lectures, were delivered under the following titles: "Introduction to differential geometry", "Introduction to shell theory", "A differential geometry approach to mesh generation", and "Numerical methods for shells". This volume gathers the materials covered in these lectures. As such, this volume should be very useful to graduate students and researchers in pure and applied mathematics. The organizers take pleasure in thanking the various organizations for their generous support: The ISFMA, the CIMPA, the French Embassy in Beijing, the Consulate General of France in Shanghai, the National Natural Science Foundation of China, Fudan University, Higher Education Press and World Scientific. Finally, our special thanks are due to Mrs. Zhou Chun-Lian for her patient and effective work in editing this book.

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## 内容概要

This book gives the basic notions of differential geometry, such as the metric tensor, the Riemann curvature tensor, the fundamental forms of a surface, covariant derivatives, and the fundamental theorem of surface theory in a self-contained and accessible manner. Although the field is often considered a "classical" one, it has recently been rejuvenated, thanks to the manifold applications where it plays an essential role. The book presents some important applications to shells, such as the theory of linearly and nonlinearly elastic shells, the implementation of numerical methods for shells, and mesh generation in finite element methods. This volume will be very useful to graduate students and researchers in pure and applied mathematics.

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### 作者简介

李大潜，数学家。  
江苏南通人。  
1957年毕业于复旦大学数学系，1966年该校在职研究生毕业。  
1997年当选为第三世界科学院院士。  
复旦大学教授。

中国工业与应用数学学会理事长，中国数学会副理事长，中法应用数学研究所所长。  
对一般形式的二自变数拟线性双曲型方程组的自由边界问题和间断解的系统研究，以及对非线性波动方程经典解的整体存在性及生命跨度的完整结果，均处于国际领先地位，得到国际上的高度评价。  
在理论研究的基础上，对各种电阻率测井建立了统一的数学模型和方法，并成功地在国内10多个油田推广使用。

1995年当选为中国科学院院士。

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