# Preface

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.

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