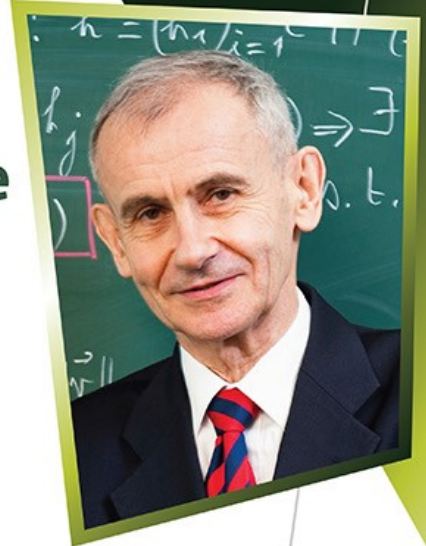# Nonlinear Korn Inequalities on a Surface

Professor Philippe G. Ciarlet

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Date： 5 November 2020 (Thursday)
Time： 3:00pm – 4:30pm

Please visit the HKIAS website at www.hkias.cityu.edu.hk to register for this online lecture via Zoom.

Abstract

It is well known that a surface can be recovered from its two fundamental forms if they satisfy the Gauss and Codazzi-Mainardi compatibility equations on a simply-connected domain, in which case the surface is uniquely determined up to isometric equivalence.

It is less known that in this case the surface becomes a continuous function of its fundamental forms, again up to isometric equivalence, for various topologies, such as the Fréchet topology of continuously differentiable functions, or those corresponding to various Sobolev norms.

In this talk, we will review such continuity results obtained during the past fifteen years, with special emphasis on those that can be derived by means of nonlinear Korn inequalities on a surface.

We will also mention potential applications of such results, such as the intrinsic approach to nonlinear shell theory, where the unknowns are the fundamental forms of the deformed middle surface of a shell.

Biography

Professor Ciarlet is well-known for his work in the mathematical analysis of the finite element method, the mathematical theory of elasticity, plates, and shells, and applications of differential geometry.

Professor Ciarlet is an Officer in the National Order of the Legion of Honor of France. He is a Member of the French Academy of Sciences, of the French Academy of Technologies, of the Academia Europaea, of the European Academy of Sciences, of the Romanian Academy, of the World Academy of Sciences (TWAS), of the National Academy of Sciences of India, a Foreign Member of the Chinese Academy of Sciences, a Member of the Hong Kong Institute of Science, a Fellow of the Society for Industrial and Applied Mathematics, a Fellow of the American Mathematical Society, and a Member of the Academy of Sciences of Hong Kong.

Professor Ciarlet's research interests include numerical analysis, finite element methods, partial differential equations, applied differential geometry, mathematical modeling in three-dimensional elasticity, plate and shell theories, and intrinsic elasticity. In addition to having published more than 200 research papers, he has written 16 books, including well-known texts such as The Finite Element Method for Elliptic Problems, Introduction to Numerical Linear Algebra and Optimization, Mathematical Elasticity (three Volumes), and Linear and Nonlinear Functional Analysis with Applications.

Professor Ciarlet has been awarded the Poncelet Prize from the French Academy of Sciences, the Grand Prize Jaffé from the French Academy of Sciences, the Gold Medal from the University of Santiago de Compostela, the Alexander von Humboldt Research Award, and the Shanghai Prize of International Cooperation in Science and Technology. He is "Doctor Honoris Causa" or "Honorary Professor" in eight universities.

All are welcome

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