Título:

Autor:

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Sinopsis

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The book is self-contained
The methods presented in the book can be applied to a wide range of domains in nonlinear analysis
Some very recent research results are presented along with more classical ones
The first chapter of the book presents, with details, the derivation of the equations of fluid mechanics

The objective of this self-contained book is two-fold. First, the reader is introduced to the modelling and mathematical analysis used in fluid mechanics, especially concerning the Navier-Stokes equations which is the basic model for the flow of incompressible viscous fluids. Authors introduce mathematical tools so that the reader is able to use them for studying many other kinds of partial differential equations, in particular nonlinear evolution problems.

The background needed are basic results in calculus, integration, and functional analysis. Some sections certainly contain more advanced topics than others. Nevertheless, the authors' aim is that graduate or PhD students, as well as researchers who are not specialized in nonlinear analysis or in mathematical fluid mechanics, can find a detailed introduction to this subject.

Content Level » Graduate

Keywords » Analysis of nonlinear parabolic equations - Incompressible Stokes and Navier-Stokes equations - Renormalized solutions of the transport equation - outflow boundary conditions

Related subjects » Classical Continuum Physics - Dynamical Systems & Differential Equations - Mechanics