

Mécanique des fluides, acoustique

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Claude LE BRIS, (Editor). — **Handbook of numerical analysis, Vol. 10: Special volume: Computational chemistry.** — Un vol. broché, 17×25, de xvi, 899 p. — ISBN 0-444-51248-9. — Prix: € 170.00. — Elsevier, Amsterdam, 2003.

The book aims to provide the reader with a general overview of the mathematical and numerical techniques used for the simulation of matter at the microscopic scale. The emphasis lays upon the numerics, but modelling aspects are also addressed. The contributors come from different scientific communities: physics, theoretical chemistry, mathematical analysis, stochastic analysis, numerical analysis. The first four contributions aim at introducing the field. They present the basics that will be used throughout the volume. The second part of the volume consists of contributions focusing on special techniques and/or applications. The volume ends with contributions, by outstanding researchers of the field, on the control of chemical reactions, in the sense “laser control of the evolution of quantum systems”, one of the major and the most promising fields of applications related to theoretical chemistry.

Informatique

L. F. SHAMPINE, I. GLADWELL, S. THOMPSON. — **Solving ODEs with Matlab** — Un vol. broché, 20×23, de viii, 263 p. — ISBN 0-521-53094-6. — Prix: £21.95. — Cambridge University Press, Cambridge, 2003.

This concise text for a one-semester course for upper-level undergraduates and beginning graduate students in engineering, science, and mathematics can also serve as a quick reference for professionals. The major topics in ordinary differential equations, initial value problems, boundary value problems, and delay differential equations, are usually taught in three separate semester-long courses, but this book provides a sound treatment of all three in about 250 pages. Each chapter begins with a discussion of the “factor of life” for the problem, mainly by means of examples. Numerical methods for the problem are then developed – but only those methods most widely used. The treatment of each method is brief and technical issues are minimized, but all the issues important in practice and for understanding the codes are discussed. The last part of each chapter is a tutorial that shows how to solve problems by means of small but realistic examples.

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D. F. PARKER. — **Fields, flows and waves: an introduction to continuum models.** — Springer undergraduate mathematics series — Un vol. broché, 18×24, de xii, 270 p. — ISBN 1-85233-708-7. — Prix: € 24.95. — Springer, London, 2003.

Mathematical ideas and techniques are widely used for describing collective phenomena in the physical and biological sciences. This book, derived from an innovative course of lectures, is a first introduction to the mathematical description of fields, flows and waves. It shows students, early in their studies, how many of the topics they have encountered are useful in constructing, analysing and interpreting phenomena in the real world. Designed for second-year undergraduate students in mathematics, mathematical physics, and engineering, it presumes only a limited familiarity with several variable calculus and vector fields. It develops the concepts of flux, conservation law and boundary value problem through simple examples of heat flow, electric potentials and gravitational fields. The ideas are developed through worked examples, and a range of exercises (with solutions) is provided to test understanding.