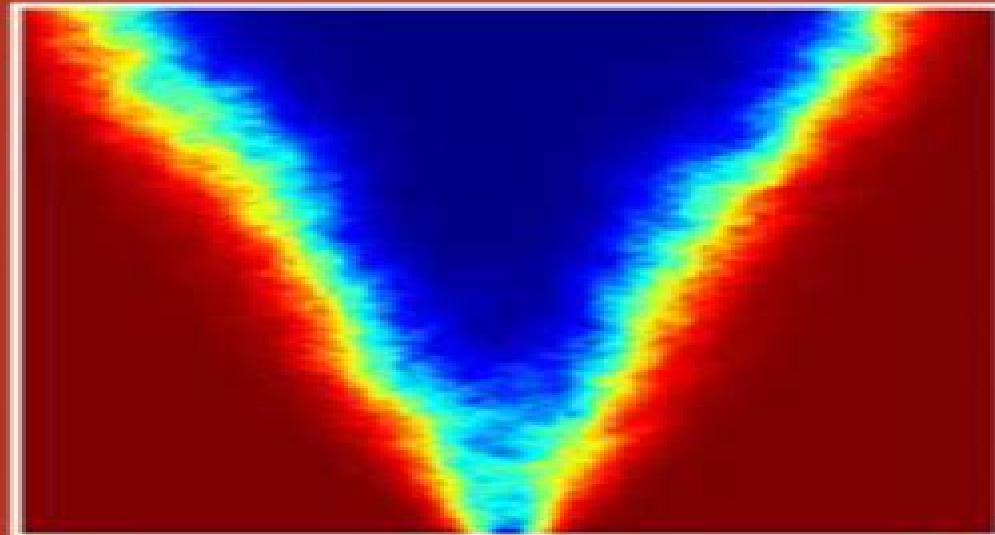


CAMBRIDGE TEXTS
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MATHEMATICS

An Introduction to Computational Stochastic PDEs



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An Introduction To Computational Stochastic Pdes

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An Introduction To Computational Stochastic Pdes Catherine E Powell:

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An Introduction to Polynomial and Semi-Algebraic Optimization Jean Bernard Lasserre, 2015-02-19 This is the first comprehensive introduction to the powerful moment approach for solving global optimization problems and some related problems described by polynomials and even semi algebraic functions In particular the author explains how to use relatively recent results from real algebraic geometry to provide a systematic numerical scheme for computing the optimal value and global minimizers Indeed among other things powerful positivity certificates from real algebraic geometry allow one to define an appropriate hierarchy of semidefinite SOS relaxations or LP relaxations whose optimal values converge to the global minimum Several extensions to related optimization problems are also described Graduate students engineers and researchers entering the field can use this book to understand experiment with and master this new approach through the simple worked examples provided

Stochastic Modelling of Reaction-Diffusion Processes Radek Erban, S. Jonathan Chapman, Jon Chapman, 2020-01-30 Practical introduction for advanced undergraduate or beginning graduate students of applied mathematics developed at the University of Oxford

Numerical Methods: Think before You Compute E. J. Hinch, 2020-04-30 This guide to computational fluid mechanics introduces beginning graduate students to the subject s standard methods and common pitfalls

The Fluid Dynamics of Cell Motility Eric Lauga, 2020-11-05 Fluid dynamics plays a crucial role in many cellular processes including the locomotion of cells such as bacteria and spermatozoa These organisms possess flagella slender organelles whose time periodic motion in a fluid environment gives rise to motility Sitting at the intersection of applied mathematics physics and biology the fluid dynamics of cell motility is one of the most successful applications of mathematical tools to the understanding of the biological world Based on courses taught over several years it details the mathematical modelling necessary to understand cell motility in fluids covering phenomena ranging from single cell motion to instabilities in cell

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Numerical Linear Algebra Holger Wendland,2018 This self contained introduction to numerical linear algebra provides a comprehensive yet concise overview of the subject It includes standard material such as direct methods for solving linear systems and least squares problems error stability and conditioning basic iterative methods and the calculation of eigenvalues Later chapters cover more advanced material such as Krylov subspace methods multigrid methods domain decomposition methods multipole expansions hierarchical matrices and compressed sensing The book provides rigorous mathematical proofs throughout and gives algorithms in general purpose language independent form Requiring only a solid knowledge in linear algebra and basic analysis this book will be useful for applied mathematicians engineers computer scientists and all those interested in efficiently solving linear problems *Microhydrodynamics, Brownian Motion, and Complex Fluids* Michael D. Graham,2018-09-13 Provides a foundation for understanding complex fluids by integrating fluid dynamics statistical physics and polymer and colloid science Geometric and Topological Inference Jean-Daniel Boissonnat,Frédéric Chazal,Mariette Yvinec,2018-09-27 Geometric and topological inference deals with the retrieval of information about a geometric object using only a finite set of possibly noisy sample points It has connections to manifold learning and provides the mathematical and algorithmic foundations of the rapidly evolving field of topological data analysis Building on a rigorous treatment of simplicial complexes and distance functions this self contained book covers key aspects of the field from data representation and combinatorial questions to manifold reconstruction and persistent homology It can serve as a textbook for graduate students or researchers in mathematics computer science and engineering interested in a geometric approach to data science Flow, Deformation and Fracture G. I. Barenblatt,2014-06-05 Over forty years of teaching experience are distilled into this text The guiding principle is the wide use of the concept of intermediate asymptotics which enables the natural introduction of the modeling of real bodies by continua Beginning with a detailed explanation of the continuum approximation for the mathematical modeling of the motion and equilibrium of real bodies the author continues with a general survey of the necessary methods and tools for analyzing models Next specific idealized approximations are presented including ideal incompressible fluids elastic bodies and Newtonian viscous fluids The author not only presents general concepts but also devotes chapters to examining significant problems including turbulence wave propagation defects and cracks fatigue and fracture Each of these applications reveals essential information about the particular approximation The author s tried and tested approach reveals insights that will be valued by every teacher and

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