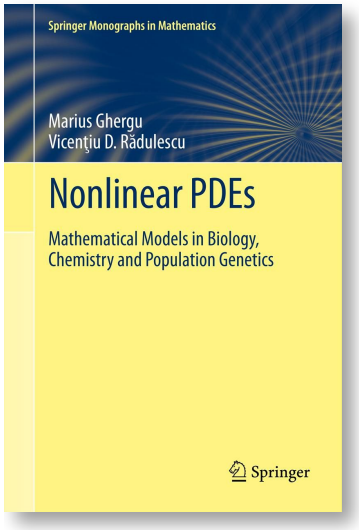

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Nonlinear PDEs

Mathematical Models in Biology, Chemistry and Population Genetics

- Foreword by Viorel Barbu
- Methods developed can be applied to large classes of models arising in applications
- Interdisciplinary dialogue between mathematics, biology, chemistry and population genetics

The emphasis throughout the present volume is on the practical application of theoretical mathematical models helping to unravel the underlying mechanisms involved in processes from mathematical physics and biosciences. It has been conceived as a unique collection of abstract methods dealing especially with nonlinear partial differential equations (either stationary or evolutionary) that are applied to understand concrete processes involving some important applications related to phenomena such as: boundary layer phenomena for viscous fluids, population dynamics,, dead core phenomena, etc. It addresses researchers and post-graduate students working at the interplay between mathematics and other fields of science and technology and is a comprehensive introduction to the theory of nonlinear partial differential equations and its main principles also presents their real-life applications in various contexts: mathematical physics, chemistry, mathematical biology, and population genetics. Based on the authors' original work, this volume provides an overview of the field, with examples suitable for researchers but also for graduate students entering research. The method of presentation appeals to readers with diverse backgrounds in partial differential equations and functional analysis. Each chapter includes detailed heuristic arguments, providing thorough motivation for the material developed later in the text. The content demonstrates in a firm way that partial differential equations can be used to address a large variety of phenomena occurring in and influencing our daily lives. The extensive reference list and index make this book a valuable resource for researchers working in a variety of fields and who are interested in phenomena modeled by nonlinear partial differential equations.

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