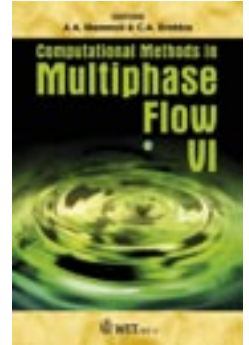
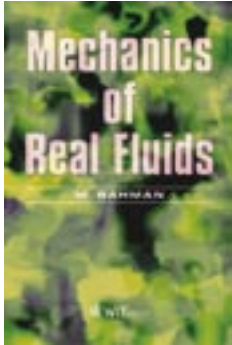




# Fluid Mechanics Titles



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*M. RAHMAN, Dalhousie University, Canada*

Fluid Mechanics is one of the most important areas of applied mathematics. Although both gas and liquids involve fluid motion, this book mainly deals with the motion of liquids in general, and water in particular. The fluid mechanics theory has grown so considerably in recent years that study of the mechanics of fluids is important in many aspects of our lives.

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### Fluid Structure Interaction VI

*Edited by: A.J. KASSAB, University of Central Florida, USA, C.A. BREBBIA, Wessex Institute of Technology, UK, E. DIVO, Daytona State University, USA and S. HERNANDEZ, University of A Coruna, Spain*

This book comprises contributions on new developments in fluid structure interaction problems presented at the sixth in a successful series of biennial conferences that began in 2001. The papers by international experts presented at the conference covered Experimental studies and validation, Response of structures, including fluid dynamics, Hydrodynamic forces, Offshore structures, Long span bridges, and Computational methods.

*WIT Transactions on the Built Environment, Vol 115*

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### Fluid Structure Interaction V

*Edited by: C.A. BREBBIA, Wessex Institute of Technology, UK*

Fluid Structure Interaction 2009 is the fifth conference in this successful series. The conference brings together international experts from various application fields to exchange information and knowledge on fluid structure interaction problems, giving them the opportunity to interact with one another and to provide valuable cross breeding of ideas and techniques. A valuable addition to this successful series, the book will be of great interest to mechanical and structural engineers, offshore engineers, earthquake engineers, naval engineers and any other experts involved in topics related to fluid structure interaction.

Papers presented at the conference cover the following areas: Computational Methods; Experimental Studies and Validation; Flow Induced Vibrations; Acoustics; Hydrodynamic Forces; Offshore Structures; Response of Structures Including Fluid Dynamics; Fluid Pipeline Interactions.

*WIT Transactions on The Built Environment, Vol 105*

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**Published 2009 / £148.00 / 400pp**

### Advances in Fluid Mechanics VIII

*Edited by: M. RAHMAN, Dalhousie University, Canada and C.A. BREBBIA, Wessex Institute of Technology, UK*

This book discusses the basic formulations of fluid mechanics and their computer modelling, as well as the relationship between experimental and analytical results. Containing papers from the Eighth International Conference on Advances in Fluid Mechanics, the book will be a seminal text to scientists, engineers and other professionals interested in the latest developments in theoretical and computational fluid mechanics.

The conference covered a wide range of topics, with emphasis on new applications and research currently in progress, which include: Computational Methods; Experimental Measurements; Hydrodynamics; Fluid Structure Interaction; Multiphase Flow; Applications in Biology; Electronic Components Cooling.

*WIT Transactions on Engineering Sciences, Vol 69*

**ISBN: 978-1-84564-476-5**  
**eISBN: 978-1-84564-477-2**  
**Published 2010 / £231.00 / 608pp**

## NEW TITLE

### Computational Methods in Multiphase Flow VI

*Edited by: A.A. MAMMOLI, University of New Mexico, USA and C.A. BREBBIA, Wessex Institute of Technology, UK*

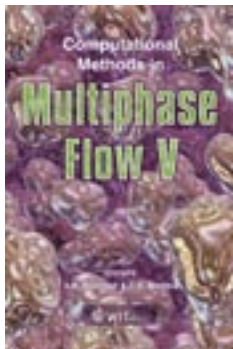
Multiphase flows, which can involve compressible or incompressible linear or nonlinear fluids, are found in all areas of technology, at all length scales and flow regimes. In spite of their ubiquitousness, however multiphase flows continue to be one of the most challenging areas of computational mechanics and experimental methods, with numerous problems remaining unsolved to date.

Multiphase flow problems are so complex that advanced computational and experimental methods are often required to solve the equations that describe them. The many challenges include modelling nonlinear fluids, modelling and tracking interfaces, dealing with multiple length scales, characterising phase structures, and treating drop breakup and coalescence. Models must be validated, which requires the use of expensive and difficult experimental techniques.

This book presents contributions on the latest research in these techniques, presented at the sixth in a biennial series of conferences on the subject that began in 2001. Featured topics include: Bubble and Drop Dynamics; Flow in Porous Media; Turbulent Flow; Multiphase Flow Simulation; Image Processing; Heat Transfer; Interaction of Gases; Liquids and Solids; Interface Behaviour; Small Scale Phenomena; Atomization Processes; Liquid Film Behaviour.

*WIT Transactions on Engineering Sciences, Vol 70*

**ISBN: 978-1-84564-518-2**  
**eISBN: 978-1-84564-519-9**  
**Published 2011 / £148.00 / 344pp**



## Computational Methods in Multiphase Flow V

Edited by: **A. MAMMOLI**, *The University of New Mexico, USA* and **C.A. BREBBIA**, *Wessex Institute of Technology, UK*

Together with turbulence, multiphase flow remains one of the most challenging areas of computational mechanics and experimental methods. Numerous problems remain unsolved to date. Multiphase flows are found in all areas of technology, at all length scales and flow regimes. The fluids involved can be compressible or incompressible, linear or nonlinear.

The complexity of the problems often requires the use of advanced computational and experimental methods to solve the equations that describe them. Challenges with these simulations include modelling and tracking interfaces, dealing with multiple length scales, modelling nonlinear fluids, treating drop breakup and coalescence, characterising phase structures, and many others. Experimental techniques, although expensive and difficult to perform, are essential to validate models.

This volume includes papers from the fifth international conference on the subject. Featured topics include: Multiphase Flow Simulation; Interaction of Gas, Liquids and Solids; Turbulent Flow; Environmental Multiphase Flow; Bubble and Drop Dynamics; Flow in Porous Media; Heat Transfer; Image Processing; Interfacial Behaviour.

**WIT Transactions on Engineering Sciences, Vol 63**

**ISBN: 978-1-84564-188-7**

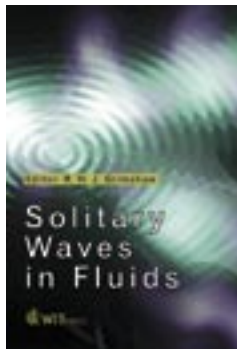
**e-ISBN: 978-1-84564-365-2**

**Published 2009 / £198.00 / 544pp**

## Solitary Waves in Fluids

Edited by: **R.H.J. GRIMSHAW**, *Loughborough University, UK*

After the initial observation by John Scott Russell of a solitary wave in a canal, his insightful laboratory experiments and the subsequent theoretical work of Boussinesq, Rayleigh and Korteweg and de Vries, interest in solitary waves in fluids lapsed until the mid 1960s with the seminal paper of Zabusky and Kruskal describing the discovery of the soliton. This was followed by the rapid development of the theory of solitons and integrable systems. At the same time came the realisation that solitary waves occur naturally in many physical systems, and play a fundamental role in many circumstances.



This text describes the role that soliton theory plays in fluids in several contexts. After an historical introduction, the book is divided into five chapters covering the basic theory of the Korteweg-de Vries equation, and the subsequent application to free-surface solitary waves in water, internal solitary waves in coastal ocean and the atmospheric boundary layer, solitary waves in rotating flows, and planetary solitary waves with applications to the ocean and atmosphere. The remaining chapters examine the theory and application of envelope solitary waves and the nonlinear Schrödinger equation to water waves.

**Series: Advances in Fluid Mechanics, Vol 47**

**ISBN: 978-1-84564-157-3**

**eISBN: 978-1-84564-265-5**

**Published 2007 / £70.00 / 208pp**

## Dam-break Problems, Solutions and Case Studies

Edited by: **D. DE WRACHIEN**, *State University of Milan, Italy* and **S. MAMBRETTI**, *Politecnico di Milano, Italy*

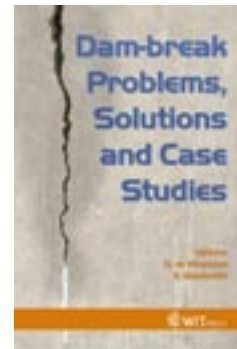
This book provides an up-to-date review on dam-break problems, along with the main theoretical background and the practical aspects involved in dam failures, design of flood defense structures, prevention measures and the environmental, social, economic and forensic aspects related to the topic. Moreover, an exhaustive range of laboratory tests and modelling techniques is explored to deal effectively with shock waves and other disasters caused by dam failures. Disaster management refers to programs and strategies designed to prevent, mitigate, prepare for, respond to and recover from the effects of these phenomena. To manage and minimise these risks, it is necessary to identify hazards and vulnerability by means of a deep knowledge of the causes that lead to dam failures, and to understand the flow propagation process.

Knowledge and advanced scientific tools play a role of paramount importance in coping with flooding and other dam-break problems along with capacity-building in the context of political and administrative frameworks. All these aspects are featured in the book, which is a comprehensive treatise that covers the most theoretical and advanced aspects of structural and hydraulic engineering, together with the hazard assessment and mitigation measures and the social, economic and forensic aspects related to the subject.

**ISBN: 978-1-84564-142-9**

**eISBN: 978-1-84564-384-3**

**Published 2009 / £140.00 / 368pp**



## Monitoring, Simulation, Prevention and Remediation of Dense and Debris Flows III

Edited by: **D. DE WRACHIEN**, *State University of Milan, Italy* and **C.A. BREBBIA**, *Wessex Institute of Technology, UK*

Due to the increased frequency with which debris and hyper-concentrated flows occur and the impact they have on both the environment and human life, these extreme events and related processes have attracted increasing attention from research groups and land planning and management professionals. A full understanding of these phenomena leads to an integrated risk management approach which provides measures for preventing a hazard turning into a natural disaster. A series of meetings provides a forum for engineers, scientists and managers from laboratories, industry, government and academia to interchange knowledge and expertise in the field of dense and hyper-concentrated flows.

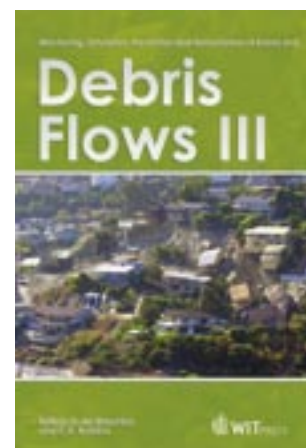
This book contains papers from the Third International Conference on Debris Flow. Papers have been grouped into the following subject areas: Debris Flow Modelling; Debris Flow Triggering; Risk Assessment and Hazard Mitigation; and Sediment Transport and Debris Flow Monitoring and Analysis.

**WIT Transactions on Engineering Sciences, Vol 67**

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