

Fluid Dynamics By M D Raisinghanian

As Computational Fluid Dynamics (CFD) and Computational Heat Transfer (CHT) evolve and become increasingly important in standard engineering design and analysis practice, users require a solid understanding of mechanics and numerical methods to make optimal use of available software. The Finite Element Method in Heat Transfer and Fluid Dynamics, Third Edition illustrates what a user must know to ensure the optimal application of computational procedures—particularly the Finite Element Method (FEM)—to important problems associated with heat conduction, incompressible viscous flows, and convection heat transfer. This book follows the tradition of the bestselling previous editions, noted for their concise explanation and powerful presentation of useful methodology tailored for use in simulating CFD and CHT. The authors update research developments while retaining the previous editions' key material and popular style in regard to text organization, equation numbering, references, and symbols. This updated third edition features new or extended coverage of: Coupled problems and parallel processing Mathematical preliminaries and low-speed compressible flows Mode superposition methods and a more detailed account of radiation solution methods Variational multi-scale methods (VMM) and least-squares finite element models (LSFEM) Application of the finite element method to non-isothermal flows Formulation of low-speed, compressible flows With its presentation of realistic, applied examples of FEM in thermal and fluid design analysis, this proven masterwork is an invaluable tool for mastering basic methodology, competently using existing simulation software, and developing simpler special-purpose computer codes. It remains one of the very best resources for

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understanding numerical methods used in the study of fluid mechanics and heat transfer phenomena.

This book is a comprehensive and intensive monograph for scientists, engineers and applied mathematicians, as well as graduate students in fluid dynamics. It starts with a brief review of fundamentals of fluid dynamics, with an innovative emphasis on the intrinsic orthogonal decomposition of fluid dynamic process, by which one naturally identifies the content and scope of vorticity and vortex dynamics. This is followed by a detailed presentation of vorticity dynamics as the basis of later development. In vortex dynamics part the book deals with the formation, motion, interaction, stability, and breakdown of various vortices. Typical vortex structures are analyzed in laminar, transitional, and turbulent flows, including stratified and rotational fluids. Physical understanding of vertical flow phenomena and mechanisms is the first priority throughout the book. To make the book self-contained, some mathematical background is briefly presented in the main text, but major prerequisites are systematically given in appendices. Material usually not seen in books on vortex dynamics is included, such as geophysical vortex dynamics, aerodynamic vortical flow diagnostics and management.

For Honours, Post Graduate and M.Phil Students of All Indian Universities, Engineering Students and Various Competitive Examinations

This book aims to include various significant research topics of mathematical fluid mechanics having relevance or applications in engineering and applied sciences, covering the tools and techniques used for developing mathematical methods and modelling related to real-life situations.

Contributed presentations were given by over 50 researchers representing the state of parallel CFD art and architecture from Asia, Europe, and North America. Major developments

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at the 1999 meeting were: (1) the effective use of as many as 2048 processors in implicit computations in CFD, (2) the acceptance that parallelism is now the 'easy part' of large-scale CFD compared to the difficulty of getting good per-node performance on the latest fast-clocked commodity processors with cache-based memory systems, (3) favorable prospects for Lattice-Boltzmann computations in CFD (especially for problems that Eulerian and even Lagrangian techniques do not handle well, such as two-phase flows and flows with exceedingly multiple-connected domains with a lot of holes in them, but even for conventional flows already handled well with the continuum-based approaches of PDEs), and (4) the nascent integration of optimization and very large-scale CFD. Further details of Parallel CFD'99, as well as other conferences in this series, are available at <http://www.parcfd.org>

This volume contains notes for 21 of the 22 major 16-mm sound films prepared under the direction of the NCFMF and covering nearly all of the fundamental phenomena of fluid motions.

The field of fluid mechanics is vast and has numerous and diverse applications. Presented papers from the 11th International Conference on Advances in Fluid Dynamics with emphasis on Multiphase and Complex Flow are contained in this book and cover a wide range of topics, including basic formulations and their computer modelling as well as the relationship between experimental and analytical results. Innovation in fluid-structure approaches including emerging applications as energy harvesting systems, studies of turbulent flows at high Reynold number, or subsonic and hypersonic flows are also among the topics covered. The emphasis placed on multiphase flow in the included research works is due to the fact that fluid dynamics processes in nature are predominantly multi-phased, i.e. involving more

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than one phase of a component such as liquid, gas or plasma. The range of related problems of interest is vast: astrophysics, biology, geophysics, atmospheric processes, and a large variety of engineering applications. Multiphase fluid dynamics are generating a great deal of interest, leading to many notable advances in experimental, analytical, and numerical studies in this area. While progress is continuing in all three categories, advances in numerical solutions are likely the most conspicuous, owing to the continuing improvements in computer power and the software tools available to researchers. Progress in numerical methods has not only allowed for the solution of many practical problems but also helped to improve our understanding of the physics involved. Many unresolved issues are inherent in the very definition of multiphase flow, where it is necessary to consider coupled processes on multiple scales, as well as the interplay of a wide variety of relevant physical phenomena.

This book is planned to publish with an objective to provide a state-of-art reference book in the area of computational fluid dynamics for CFD engineers, scientists, applied physicists and post-graduate students. Also the aim of the book is the continuous and timely dissemination of new and innovative CFD research and developments. This reference book is a collection of 14 chapters characterized in 4 parts: modern principles of CFD, CFD in physics, industrial and in castle. This book provides a comprehensive overview of the computational experiment technology, numerical simulation of the hydrodynamics and heat transfer processes in a two dimensional gas, application of lattice Boltzmann method in heat transfer and fluid flow, etc. Several interesting applications area are also discusses in the book like underwater vehicle propeller, the flow behavior in gas-cooled nuclear reactors, simulation odour dispersion around windbreaks and so on.

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'Fluid Mechanics and Machinery' is designed for students of civil and mechanical engineering. It provides a clear understanding of the behaviour of fluids at both rest and motion, and further conversion into useful work. Using an experimental and demonstrative approach to explain concepts, the initial chapters of the book discuss the fundamental physics of fluids such as statics, kinematics, conservation equations, and boundary layer. The book, in subsequent chapters, presents the behaviour of fluids in pipe flow, open channel flow, and flow in compressible fluids, followed by an exclusive chapter on fluid machinery.

Both broad and deep in coverage, Rubenstein shows that fluid mechanics principles can be applied not only to blood circulation, but also to air flow through the lungs, joint lubrication, intraocular fluid movement and renal transport. Each section initiates discussion with governing equations, derives the state equations and then shows examples of their usage. Clinical applications, extensive worked examples, and numerous end of chapter problems clearly show the applications of fluid mechanics to biomedical engineering situations. A section on experimental techniques provides a springboard for future research efforts in the subject area. Uses language and math that is appropriate and conducive for undergraduate learning, containing many worked examples and end of chapter

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problems All engineering concepts and equations are developed within a biological context Covers topics in the traditional biofluids curriculum, as well as addressing other systems in the body that can be described by biofluid mechanics principles, such as air flow through the lungs, joint lubrication, intraocular fluid movement, and renal transport Clinical applications are discussed throughout the book, providing practical applications for the concepts discussed.

We are delighted to present this book which contains the Proceedings of the Fifth International Conference on Computational Fluid Dynamics (ICCFD5), held in Seoul, Korea from July 7 through 11, 2008. The ICCFD series has established itself as the leading international conference series for scientists, mathematicians, and engineers specialized in the computation of fluid flow. In ICCFD5, 5 Invited Lectures and 3 Keynote Lectures were delivered by renowned researchers in the areas of innovative modeling of flow physics, innovative algorithm development for flow simulation, optimization and control, and advanced multidisciplinary - plications. There were a total of 198 contributed abstracts submitted from 25 countries. The executive committee consisting of C. H. Bruneau (France), J. J. Chattot (USA), D. Kwak (USA), N. Satofuka (Japan), and myself, was responsible for selection of papers. Each of the members had a separate

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subcommittee to carry out the evaluation. As a result of this careful peer review process, 138 papers were accepted for oral presentation and 28 for poster presentation. Among them, 5 (3 oral and 2 poster presentation) papers were withdrawn and 10 (4 oral and 6 poster presentation) papers were not presented. The conference was attended by 201 delegates from 23 countries. The technical aspects of the conference were highly beneficial and informative, while the non-technical aspects were fully enjoyable and memorable. In this book, 3 invited lectures and 1 keynote lecture appear first. Then 99 contributed papers are grouped under 21 subject titles which are in alphabetical order.

Modern Fluid Dynamics, Second Edition provides up-to-date coverage of intermediate and advanced fluids topics. The text emphasizes fundamentals and applications, supported by worked examples and case studies. Scale analysis, non-Newtonian fluid flow, surface coating, convection heat transfer, lubrication, fluid-particle dynamics, microfluidics, entropy generation, and fluid-structure interactions are among the topics covered. Part A presents fluids principles, and prepares readers for the applications of fluid dynamics covered in Part B, which includes computer simulations and project writing. A review of the engineering math needed for fluid dynamics is included in an appendix.

This book is the result of a careful selection of

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contributors in the field of CFD. It is divided into three sections according to the purpose and approaches used in the development of the contributions. The first section describes the "high-performance computing" (HPC) tools and their impact on CFD modeling. The second section is dedicated to "CFD models for local and large-scale industrial phenomena." Two types of approaches are basically contained here: one concerns the adaptation from global to local scale, - e.g., the applications of CFD to study the climate changes and the adaptations to local scale. The second approach, very challenging, is the multiscale analysis. The third section is devoted to "CFD in numerical modeling approach for experimental cases." Its chapters emphasize on the numerical approach of the mathematical models associated to few experimental (industrial) cases. Here, the impact and the importance of the mathematical modeling in CFD are focused on. It is expected that the collection of these chapters will enrich the state of the art in the CFD domain and its applications in a lot of fields. This collection proves that CFD is a highly interdisciplinary research area, which lies at the interface of physics, engineering, applied mathematics, and computer science. This is the most comprehensive introductory graduate or advanced undergraduate text in fluid mechanics available. It builds from the

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fundamentals, often in a very general way, to widespread applications to technology and geophysics. In most areas, an understanding of this book can be followed up by specialized monographs and the research literature. The material added to this new edition will provide insights gathered over 45 years of studying fluid mechanics. Many of these insights, such as universal dimensionless similarity scaling for the laminar boundary layer equations, are available nowhere else. Likewise for the generalized vector field derivatives. Other material, such as the generalized stream function treatment, shows how stream functions may be used in three-dimensional flows. The CFD chapter enables computations of some simple flows and provides entrée to more advanced literature. *New and generalized treatment of similar laminar boundary layers. *Generalized treatment of streamfunctions for three-dimensional flow . *Generalized treatment of vector field derivatives. *Expanded coverage of gas dynamics. *New introduction to computational fluid dynamics. *New generalized treatment of boundary conditions in fluid mechanics. *Expanded treatment of viscous flow with more examples.

Computational fluid dynamics (CFD) is concerned with the efficient numerical solution of the partial differential equations that describe fluid dynamics. CFD techniques are commonly used in the many areas of engineering where fluid behavior is an

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important factor. Traditional fields of application include aerospace and automotive design, and more recently, bioengineering and consumer and medical electronics. With Applied Computational Fluid Dynamics Techniques, 2nd edition, Rainald Löhner introduces the reader to the techniques required to achieve efficient CFD solvers, forming a bridge between basic theoretical and algorithmic aspects of the finite element method and its use in an industrial context where methods have to be both as simple but also as robust as possible. This heavily revised second edition takes a practice-oriented approach with a strong emphasis on efficiency, and offers important new and updated material on; Overlapping and embedded grid methods Treatment of free surfaces Grid generation Optimal use of supercomputing hardware Optimal shape and process design Applied Computational Fluid Dynamics Techniques, 2nd edition is a vital resource for engineers, researchers and designers working on CFD, aero and hydrodynamics simulations and bioengineering. Its unique practical approach will also appeal to graduate students of fluid mechanics and aero and hydrodynamics as well as biofluidics. This volume contains the proceedings of the ICASE/LaRC Work shop on the "Algorithmic Trends for Computational Fluid Dynamics (CFD) in the 90's" conducted by the Institute for Computer Applications in Science and Engineering (ICASE) and the Fluid

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Mechanics Division of NASA Langley Research Center during September 15-17, 1991. The purpose of the workshop was to bring together numerical analysts and computational fluid dynamicists i) to assess the state of the art in the areas of numerical analysis particularly relevant to CFD, ii) to identify promising new developments in various areas of numerical analysis that will have impact on CFD, and iii) to establish a long-term perspective focusing on opportunities and needs. This volume consists of five chapters - i) Overviews, ii) Acceleration Techniques, iii) Spectral and Higher-Order Methods, iv) Multi Resolution/ Subcell Resolution Schemes (including adaptive methods), and v) Inherently Multidimensional Schemes. Each chapter covers a session of the Workshop. The chapter on overviews contains the articles by J.L. Steger, H.-O. Kreiss, R.W. MacCormack, O.

In this Special Issue, one review paper highlights the necessity of multiscale CFD, coupling micro- and macro-scales, for exchanging information at the interface of the two scales. Four research papers investigate the hydrodynamics, heat transfer, and chemical reactions of various processes using Eulerian CFD modeling. CFD models are attractive for industrial applications. However, substantial efforts in physical modeling and numerical implementation are still required before their widespread implementation.

Basic knowledge about fluid mechanics is required in various areas of water resources engineering such as designing hydraulic structures and turbomachinery. The applied fluid mechanics laboratory course is designed to enhance civil

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engineering students' understanding and knowledge of experimental methods and the basic principle of fluid mechanics and apply those concepts in practice. The lab manual provides students with an overview of ten different fluid mechanics laboratory experiments and their practical applications. The objective, practical applications, methods, theory, and the equipment required to perform each experiment are presented. The experimental procedure, data collection, and presenting the results are explained in detail.

LAB

This book explores the theoretical and computational aspects of the fluid dynamics and transport of sprays and droplets. This volume contains 25 review articles by experts which provide up-to-date information about the recent progress in computational fluid dynamics (CFD). Due to the multidisciplinary nature of CFD, it is difficult to keep up with all the important developments in related areas. CFD Review 2010 would therefore be useful to researchers by covering the state-of-the-art in this fast-developing field.

This is the second volume in a four-part series on fluid dynamics: Part 1. Classical Fluid Dynamics Part 2. Asymptotic Problems of Fluid Dynamics Part 3. Boundary Layers Part 4. Hydrodynamic Stability Theory The series is designed to give a comprehensive and coherent description of fluid dynamics, starting with chapters on classical theory suitable for an introductory undergraduate lecture course, and then progressing through more advanced material up to the level of modern research in the field. In Part 2 the reader is introduced to asymptotic methods, and their applications to fluid dynamics. Firstly, it discusses the mathematical aspects of the asymptotic theory. This is followed by an exposition of the results of inviscid flow theory, starting with subsonic flows past thin aerofoils. This includes unsteady flow theory and the analysis of separated flows. The authors then consider

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supersonic flow past a thin aerofoil, where the linear approximation leads to the Ackeret formula for the pressure. They also discuss the second order Buzemann approximation, and the flow behaviour at large distances from the aerofoil. Then the properties of transonic and hypersonic flows are examined in detail. Part 2 concludes with a discussion of viscous low-Reynolds-number flows. Two classical problems of the low-Reynolds-number flow theory are considered, the flow past a sphere and the flow past a circular cylinder. In both cases the flow analysis leads to a difficulty, known as Stokes paradox. The authors show that this paradox can be resolved using the formalism of matched asymptotic expansions.

This book comprises selected peer-reviewed proceedings of the International Conference on Applications of Fluid Dynamics (ICAFD 2018) organized by the School of Advanced Sciences, Vellore Institute of Technology, India, in association with the University of Botswana and the Society for Industrial and Applied Mathematics (SIAM), USA. With an aim to identify the existing challenges in the area of applied mathematics and mechanics, the book emphasizes the importance of establishing new methods and algorithms to address these challenges. The topics covered include diverse applications of fluid dynamics in aerospace dynamics and propulsion, atmospheric sciences, compressible flow, environmental fluid dynamics, control structures, viscoelasticity and mechanics of composites. Given the contents, the book is a useful resource for students, researchers as well as practitioners.

This handbook covers computational fluid dynamics from fundamentals to applications. This text provides a well documented critical survey of numerical methods for fluid mechanics, and gives a state-of-the-art description of computational fluid mechanics, considering numerical

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analysis, computer technology, and visualization tools. The chapters in this book are invaluable tools for reaching a deeper understanding of the problems associated with the calculation of fluid motion in various situations: inviscid and viscous, incompressible and compressible, steady and unsteady, laminar and turbulent flows, as well as simple and complex geometries. Each chapter includes a related bibliography Covers fundamentals and applications Provides a deeper understanding of the problems associated with the calculation of fluid motion

Paperback edition of text on fluid dynamics for graduate students and specialists alike.

Although many books have been written on computational fluid dynamics (CFD) and many written on combustion, most contain very limited coverage of the combination of CFD and industrial combustion. Furthermore, most of these books are written at an advanced academic level, emphasize theory over practice, and provide little help to engineers who need to use CFD for combustion modeling. Computational Fluid Dynamics in Industrial Combustion fills this gap in the literature. Focusing on topics of interest to the practicing engineer, it codifies the many relevant books, papers, and reports written on this combined subject into a single, coherent reference. It looks at each topic from a somewhat narrow perspective to see how that topic affects modeling in industrial combustion. The editor and his team of expert authors address these topics within three main sections: Modeling Techniques-The basics of CFD modeling in combustion Industrial Applications-Specific applications of CFD in the steel, aluminum, glass, gas turbine, and petrochemical industries Advanced Techniques-Subjects rarely addressed in other texts, including design optimization, simulation, and visualization Rapid increases in computing power and significant advances in commercial CFD codes

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have led to a tremendous increase in the application of CFD to industrial combustion. Thorough and clearly representing the techniques and issues confronted in industry, Computational Fluid Dynamics in Industrial Combustion will help bring you quickly up to date on current methods and gain the ability to set up and solve the various types of problems you will encounter.

The numerical simulation of fluid mechanics and heat transfer problems is now a standard part of engineering practice. The widespread availability of capable computing hardware has led to an increased demand for computer simulations of products and processes during their engineering design and manufacturing phases. The range of fluid mechanics and heat transfer applications of finite element analysis has become quite remarkable, with complex, realistic simulations being carried out on a routine basis. The award-winning first edition of The Finite Element Method in Heat Transfer and Fluid Dynamics brought this powerful methodology to those interested in applying it to the significant class of problems dealing with heat conduction, incompressible viscous flows, and convection heat transfer. The Second Edition of this bestselling text continues to provide the academic community and industry with up-to-date, authoritative information on the use of the finite element method in the study of fluid mechanics and heat transfer. Extensively revised and thoroughly updated, new and expanded material includes discussions on difficult boundary conditions, contact and bulk nodes, change of phase, weighted-integral statements and weak forms, chemically reactive systems, stabilized methods, free surface problems, and much more. The Finite Element Method in Heat Transfer and Fluid Dynamics offers students a pragmatic treatment that views numerical computation as a means to an end and does not dwell on theory or proof. Mastering its contents brings a firm understanding of the

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basic methodology, competence in using existing simulation software, and the ability to develop some simpler, special purpose computer codes.

The simulation of physical systems requires a simplified, hierarchical approach which models each level from the atomistic to the macroscopic scale. From quantum mechanics to fluid dynamics, this book systematically treats the broad scope of computer modeling and simulations, describing the fundamental theory behind each level of approximation.

Berendsen evaluates each stage in relation to its applications giving the reader insight into the possibilities and limitations of the models. Practical guidance for applications and sample programs in Python are provided. With a strong emphasis on molecular models in chemistry and biochemistry, this 2007 book will be suitable for advanced undergraduate and graduate courses on molecular modeling and simulation within physics, biophysics, physical chemistry and materials science. It will also be a useful reference to all those working in the field. Additional resources for this title including solutions for instructors and programs are available online at www.cambridge.org/9780521835275.

Fluid Dynamics S. Chand Publishing

This is an introduction to the dynamics of fluids at small scales, the physical and mathematical underpinnings of Brownian motion, and the application of these subjects to the dynamics and flow of complex fluids such as colloidal suspensions and polymer solutions. It brings together continuum mechanics, statistical mechanics, polymer and colloid science, and various branches of applied mathematics, in a self-contained and integrated treatment that provides a foundation for understanding complex fluids, with a strong emphasis on fluid dynamics. Students and researchers will find that this book is extensively cross-referenced to illustrate connections between different aspects

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of the field. Its focus on fundamental principles and theoretical approaches provides the necessary groundwork for research in the dynamics of flowing complex fluids. Handbook of Fluid Dynamics offers balanced coverage of the three traditional areas of fluid dynamics—theoretical, computational, and experimental—complete with valuable appendices presenting the mathematics of fluid dynamics, tables of dimensionless numbers, and tables of the properties of gases and vapors. Each chapter introduces a different fluid

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A beloved introductory physics textbook, now including exercises and an answer key, explains the concepts essential for thorough scientific understanding. In this concise book, R. Shankar, a well-known physicist and contagiously enthusiastic educator, explains the essential concepts of Newtonian mechanics, special relativity, waves, fluids, thermodynamics, and statistical mechanics. Now in an expanded edition—complete with problem sets and answers for course use or self-study—this work provides an ideal introduction for college-level students of physics, chemistry, and engineering; for AP Physics students; and for general readers interested in advances in the sciences. The book begins at the simplest level, develops the basics, and reinforces fundamentals, ensuring a solid foundation in the principles and methods of physics.

The rigorous mathematical theory of the equations of fluid dynamics has been a focus of intense activity in recent years. This volume is the product of a workshop held at the University of Warwick to consolidate, survey and further advance the subject. The Navier–Stokes equations feature prominently:

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the reader will find new results concerning feedback stabilisation, stretching and folding, and decay in norm of solutions to these fundamental equations of fluid motion. Other topics covered include new models for turbulent energy cascade, existence and uniqueness results for complex fluids and certain interesting solutions of the SQG equation. The result is an accessible collection of survey articles and more traditional research papers that will serve both as a helpful overview for graduate students new to the area and as a useful resource for more established researchers.

This Element presents a unified computational fluid dynamics framework from rarefied to continuum regimes. The framework is based on the direct modelling of flow physics in a discretized space. The mesh size and time step are used as modelling scales in the construction of discretized governing equations. With the variation-of-cell Knudsen number, continuous modelling equations in different regimes have been obtained, and the Boltzmann and Navier-Stokes equations become two limiting equations in the kinetic and hydrodynamic scales. The unified algorithms include the discrete velocity method (DVM)-based unified gas-kinetic scheme (UGKS), the particlebased unified gas-kinetic particle method (UGKP), and the wave and particle-based unified gas-kinetic wave-particle method (UGKWP). The UGKWP is a multi-scale method with the

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particle for non-equilibrium transport and wave for equilibrium evolution. The particle dynamics in the rarefied regime and the hydrodynamic flow solver in the continuum regime have been unified according to the cell's Knudsen number.

This book contains the successful submissions to a Special Issue of *Energies* entitled “Engineering Fluid Dynamics 2019–2020”. The topic of engineering fluid dynamics includes both experimental and computational studies. Of special interest were submissions from the fields of mechanical, chemical, marine, safety, and energy engineering. We welcomed original research articles and review articles. After one-and-a-half years, 59 papers were submitted and 31 were accepted for publication. The average processing time was about 41 days. The authors had the following geographical distribution: China (15); Korea (7); Japan (3); Norway (2); Sweden (2); Vietnam (2); Australia (1); Denmark (1); Germany (1); Mexico (1); Poland (1); Saudi Arabia (1); USA (1); Serbia (1). Papers covered a wide range of topics including analysis of free-surface waves, bridge girders, gear boxes, hills, radiation heat transfer, spillways, turbulent flames, pipe flow, open channels, jets, combustion chambers, welding, sprinkler, slug flow, turbines, thermoelectric power generation, airfoils, bed formation, fires in tunnels, shell-and-tube heat exchangers, and pumps.

Computational fluid dynamics, CFD, has become an

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indispensable tool for many engineers. This book gives an introduction to CFD simulations of turbulence, mixing, reaction, combustion and multiphase flows. The emphasis on understanding the physics of these flows helps the engineer to select appropriate models to obtain reliable simulations. Besides presenting the equations involved, the basics and limitations of the models are explained and discussed. The book combined with tutorials, project and power-point lecture notes (all available for download) forms a complete course. The reader is given hands-on experience of drawing, meshing and simulation. The tutorials cover flow and reactions inside a porous catalyst, combustion in turbulent non-premixed flow, and multiphase simulation of evaporation spray respectively. The project deals with design of an industrial-scale selective catalytic reduction process and allows the reader to explore various design improvements and apply best practice guidelines in the CFD simulations.

We are pleased to present the Proceedings of the Second International Conference on Computational Fluid Dynamics held at the University of Sydney, Australia, from July 15 to 19, 2002. The conference was a productive meeting of scientists, mathematicians and engineers involved in the computation of fluid flow. Keynote lectures were presented in the areas of optimisation, algorithms,

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turbulence and bio-fluid mechanics. Two hundred and fifty abstracts from many countries were received for consideration. The executive committee, consisting of A. Lerat, M. Napolitano, J.J. Chattot, N. Satofuka and myself, were responsible for the selection of papers. Each of the members had a separate subcommittee to carry out the evaluation. One hundred and seventy papers were selected of which one hundred and fifty two were presented at the conference. All papers that appear in the proceedings have been peer reviewed by a panel of experts (with a minimum of two for every paper) before publication. The conference was attended by 160 delegates with a minimum of late with drawals. The informal and friendly atmosphere provided by the university surroundings was highly appreciated, and the technical aspects of the conference were stimulating. It is appropriate here to thank Alain Lerat, the retiring secretary of the international scientific committee of the conference. We also wish to welcome J. J. Chattot who is the incoming secretary.

Presents a powerful new framework for out-of-equilibrium hydrodynamics, with connections to kinetic theory, AdS/CFT and applications to high-energy particle collisions.

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