

Dyson Fan Ansys

This book provides the bridge between engineering design and medical device development. There is no single text that addresses the plethora of design issues a medical devices designer meets when developing new products or improving older ones. It addresses medical devices' regulatory (FDA and EU) requirements--some of the most stringent engineering requirements globally. Engineers failing to meet these requirements can cause serious harm to users as well as their products' commercial prospects. This Handbook shows the essential methodologies medical designers must understand to ensure their products meet requirements. It brings together proven design protocols and puts them in an explicit medical context based on the author's years of academia (R&D phase) and industrial (commercialization phase) experience. This methodology enables engineers and medical device manufacturers to bring new products to the marketplace rapidly. The medical device market is a multi-billion dollar industry. Every engineered product for this sector, from scalpels to complex medical equipment, must be designed and developed to approved procedures and standards. This book shows how Covers US, and EU and ISO standards. This international approach, providing a guide to the international standards that practicing engineers require to understand Written by an experienced medical device engineers and entrepreneurs with products in the from the US and UK and with real world experience of developing and commercializing medical products

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 were presented. 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), myself, was responsible for selection of papers. Each of the members had a separate 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. A total of 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 c- tributed papers are grouped under 21 subject titles which are in alphabetical order.

These papers are concerned with new advances and novel solutions in the areas of biofluids, image-guided surgery, tissue engineering and cardiovascular mechanics, implant analysis, soft tissue mechanics, bone remodeling and motion analysis. The contents also feature a special section on dental materials, dental adhesives and orthodontic mechanics. This edition contains many examples, tables and figures. The many references, provides the reader with invaluable information on the latest theoretical developments and applications.

This book introduces the subject of total design, and introduces the design and selection of various common mechanical engineering components and machine elements. These provide "building blocks", with which the engineer can practice his or her art. The approach adopted for defining design follows that developed by the SEED (Sharing Experience in Engineering Design) programme where design activity necessary to provide a product or process to meet a market need." Within this framework the book concentrates on developing detailed mechanical design skills in the areas of bearings, shafts, gears, seals, belt and chain drives, clutches and brakes, springs and fasteners. Where standard components are available from manufacturers, the steps necessary for their specification and selection are provided. Where components are not available, the design and selection processes, detailed examples are used within the text has been to provide descriptive and illustrative information to introduce principles and individual components and to expose the reader to the detailed methods and calculations necessary to specify and design or select a component. To provide the reader with sufficient information to develop the necessary skills to repeat calculations and selection processes, detailed examples are provided throughout the text. This book is principally a Year/Level 1 and 2 undergraduate text. Pre-requisite skills include some year one undergraduate mathematics, fluid mechanics and heat transfer, principles of materials, statics and dynamics. However, as the subjects are introduced in a descriptive and illustrative format and as full worked solutions are provided, it is possible for readers without this background to benefit from this book. The text is specifically aimed at automotive and mechanical engineering degree programmes and would be of value for modules in design, mechanical engineering design, design and manufacture, design studies, automotive power-train and transmission and tribology, as well as modules and project work incorporating a design element requiring knowledge about any of the content. The objectives described are achieved by a short introductory chapters on total design, mechanical engineering and machine elements followed by ten chapters on machine elements covering: bearings, shafts, gears, seals, chain and belt drives, clutches and brakes, springs, fasteners and miscellaneous mechanisms. Chapters 14 and 15 introduce casings and enclosures and sensors and actuators, key components of modern mechanical technology. The subject of tolerancing from a component to a process level is introduced in Chapter 16. The last chapter serves to present an integrated design using the detailed design aspects covered within the book. The design methods where appropriate are developed to national and international standards (e.g. ANSI, ASME, AGMA, BSI, DIN, ISO). The first edition of this text introduced design elements as building blocks with which design of mechanical devices can be undertaken. The approach adopted of introducing and explaining the aspects of technology by means of text, photographs, diagrams and step-by-step procedures has been maintained. A number of important machine elements have been included in the new edition, fasteners, springs, sensors and actuators. They are included in the design, the scope of mechanical engineering and machine elements have been completely revised and updated. New chapters are included on casings and enclosures and miscellaneous mechanisms and the final chapter has been rewritten to provide an integrated approach. Multiple worked examples and completed solutions are included.

A laser-doppler anemometer was used to obtain flow-field velocity measurements in a 4:1 pressure ratio, 4.54 kg/s (10 lbm/s), centrifugal impeller, with splitter blades and backsweep, which was configured with a vaneless diffuser. Measured through-flow velocities are reported for ten quasi-orthogonal survey planes at locations ranging from 1% to 99% of main blade chord. Measured through-flow velocities are compared with those predicted by a 3-D viscous steady flow analysis (Dawes) code. The measurements show the development and progression through the impeller and vaneless diffuser of a through-flow velocity deficit which results from the tip clearance flow and accumulation of low momentum fluid centrifuged from the blade and hub surfaces. Flow traces from the CFD analysis show the origin of this deficit within the impeller where it is first detected near the suction surface side of the passage. It then moves toward the pressure side of the channel, due to the movement of tip clearance flow across the impeller passage, where it is cut by the splitter blade leading edge. As blade loading increases toward the rear of the channel the deficit region is driven back toward the suction surface by the cross-passage flow.

evidence of a large wake region that might result from flow separation and the impeller efficiency is relatively high. The flow field in this impeller is quite similar to that documented previously by NASA Lewis in a large low-speed backswept impeller.

Ship Resistance and Propulsion

Design for Creep

Gas Turbine Heat Transfer and Cooling Technology, Second Edition

Methodology and Application to Life Science and Materials Science

Self-diffusion and Impurity Diffusion in Pure Metals

Proceedings of the 1st International Conference on Communication and Computer Engineering

Two-Phase Flow for Automotive and Power Generation Sectors

Train Aerodynamics: Fundamentals and Applications is the first reference to provide a comprehensive overview of train aerodynamics with full scale data results. With the most up-to-date information on recent advances and the possibilities of improvement in railway facilities, this book will benefit railway engineers, train operators, train manufacturers and researchers of train aerodynamics. As the subject of train aerodynamics has evolved slowly over the last few decades with train speeds gradually increasing, and as a result of increasing interest in new train types and high-speed lines, this book provides a timely resource on the topic. Examines the fundamentals and the state-of-the-art of train aerodynamics experimental, numerical and analytical tools, and then thoroughly discussing the specific approaches in other sections Features the latest developments and progress in computational aerodynamics and experimental facilities Addresses problems relating to train aerodynamics, from the dimensioning of railway structures and trains, to risk assessment and maintenance Discusses basic flow patterns caused by bridges and embankments

This volume provides a comprehensive reference for graduate students and professionals in both academia and industry on the fundamentals, processing details, and applications of 3D microelectronic packaging, an industry trend for future microelectronic packages. Chapters written by experts cover the most recent research results and design trends in 3D packaging, TSV, die processing, micro bumps, direct bonding, thermal compression bonding, advanced materials, heat dissipation, thermal management, thermal mechanical modeling, quality, reliability, fault isolation, and failure analysis of 3D microelectronic packages. Numerous images, tables, and didactic schematics are included throughout. This essential reference provides depth understanding of all aspects of 3D packaging, including packaging architecture, processing, thermal mechanical and moisture related reliability concerns, common failures, developing areas, and future challenges, providing insights into key areas for future research and development.

This book describes the advanced developments in methodology and applications of NMR spectroscopy to life science and materials science. Experts who are leaders in the development of new methods and applications of life and material sciences have contributed an exciting range of topics that cover recent advances in structural determination of macromolecules, dynamic aspects of biological and material molecules, and development of novel NMR techniques, including resolution and sensitivity enhancement. First, this book particularly emphasizes the experimental details for new researchers to use NMR spectroscopy and pick up the potentials of NMR spectroscopy. Second, the book is designed for researchers developing the technique or expanding the NMR application fields by applying them to specific samples. Third, the Nuclear Magnetic Resonance Society of Japan has organized this book not only for NMR members of Japan but also for readers worldwide who are interested in using NMR spectroscopy extensively.

As India approaches its seventieth year of Independence, its people continue to grapple with multiple discourses: a few from the left, a considerable sum from the right and an impressive lot from the centre. This book brings together diverse views from people across a wide spectrum of life-politicians, activists, administrators, artistes, academicians and a contextual introduction by Nidhi Razdan, this politically charged, argumentative, candid and humorous book opens a window to our understanding of India that largely remained untold and unknown for a long time.

Investigating in the area of perovskite materials and the fabrication of devices for properties in optoelectronics, we have presented a brief outline of perovskite materials. The authors present a fairly comprehensive arrangement of this very active area of research, with its past changes and present position and outlooks. Discussions are provided on the fabrication of solar cell devices and their stability, lead-free materials, as well as thermoelectric and piezoelectric applications. In view of the present status of perovskite materials, I am assured that each chapter of the book will be of boundless encouragement for researchers, scientists, and academicians working in this field.

Recent Advances

Organic Rankine Cycle (ORC) Power Systems

Innovation from Concept to Market

Volume 2

Electrified Aircraft Propulsion

Train Aerodynamics

Fundamentals and Applications

Ship Resistance and Propulsion provides a comprehensive approach to evaluating ship resistance and propulsion. Informed by applied research, including experimental and CFD techniques, this book provides guidance for the practical estimation of ship propulsive power for a range of ship types. Published standard series data for hull resistance and propeller performance enables practitioners to make ship power predictions based on material and data contained within the book. Fully worked examples illustrate applications of the data and powering methodologies; these include cargo and container ships, tankers and bulk carriers, ferries, warships, patrol craft, work boats, planing craft and yachts. The book is aimed at a broad readership including practising naval architects and marine engineers, seagoing officers, small craft designers, undergraduate and postgraduate students. Also useful for those involved in transportation, transport efficiency and ecologists who need to carry out reliable estimates of ship power requirements.

In addition to introducing the basics of plasma physics, Nonthermal Plasma Chemistry and Physics is a comprehensive presentation of recent developments in the rapidly growing field of nonthermal plasma chemistry. The book offers a detailed discussion of the fundamentals of plasma chemical reactions and modeling, nonthermal plasma sources, relevant diagnostic techniques, and selected applications. Elucidating interconnections and trends, the book focuses on basic principles and illustrations across a broad field of applications. Expert contributors address environmental aspects of plasma chemistry. The book also includes selected plasma conditions and specific applications in volume plasma chemistry and treatment of material surfaces such as plasma etching in microelectronics, chemical modification of polymer surfaces and deposition of functional thin films. Designed for students of plasma physics, Nonthermal Plasma Chemistry and Physics is a concise resource also for specialists in this and related fields of research.

This volume collects the proceedings of the 23rd International Course of Crystallography, entitled "X-ray and Neutron Dynamical Diffraction, Theory and Applications," which took place in the fascinating setting of Erice in Sicily, Italy. It was run as a NATO Advanced Studies Institute with A. Authier (France) and S. Lagomarsino (Italy) as codirectors, and L. Riva di Sanseverino and P. Spadon (Italy) as local organizers, R. Colella (USA) and B. K. Tanner (UK) being the two other members of the organizing committee. It was attended by about one hundred participants from twenty four different countries. Two basic theories may be used to describe the diffraction of radiation by crystalline matter. The first one, the so-called geometrical, or kinematical theory, is approximate and is applicable to small, highly imperfect crystals. It is used for the determination of crystal structures and describes the diffraction of powders and polycrystalline materials. The other one, the so-called dynamical theory, is applicable to perfect or nearly perfect crystals. For that reason, dynamical diffraction of X-rays and neutrons constitutes the theoretical basis of a great variety of applications such as:
• the techniques used for the characterization of nearly perfect high technology materials, semiconductors, superconductors, piezoelectric, electrooptic, ferroelectric, magnetic crystals,
• the X-ray optical devices used in all modern applications of Synchrotron Radiation (EXAFS, High Resolution X-ray Diffractometry, magnetic and nuclear resonant scattering, topography, etc.), and
• X-ray and neutron interferometry.

This book constitutes the proceedings of the 1st International Conference on Advances in Emerging Trends and Technologies (ICAETT 2019), held in Quito, Ecuador, on 29–31 May 2019, jointly organized by Universidad Tecnológica Israel, Universidad Técnica del Norte, and Instituto Tecnológico Superior Rumiñahui, and supported by SNOTRA. ICAETT 2019 brought together top researchers and practitioners working in different domains of computer science to share their expertise and to discuss future developments and potential collaborations. Presenting high-quality, peer-reviewed papers, the book discusses the following topics: Technology Trends Electronics Intelligent Systems Machine Vision Communication Security e-Learning e-Business e-Government and e-Participation

This book aims at finding some answers to the questions: What is the influence of humans in controlling CAD and how much is human in control of its surroundings? How far does our reach as humans really go? Do the complex algorithms that we use for city planning nowadays live up to their expectations and do they offer enough quality? How much data do we have and can we control? Are today 's inventions reversing the humanly controlled algorithms into a space where humans are controlled by the algorithms? Are processing power, robots for the digital environment and construction in particular not only there to rediscover what we already knew and know or do they really bring us further into the fields of constructing and architecture? The chapter authors were invited speakers at the 6th Symposium "Design Modelling Symposium: Humanizing Digital Reality", which took place in Ensa-Versailles, France from 16 - 20 September 2017.

Introduction to Turbomachinery

Volume II

Heterogeneous Photocatalysis

12th International Conference on Vibrations in Rotating Machinery

The High Luminosity Large Hadron Collider

Left, Right and Centre

Laser Anemometer Measurements of the Flow Field in a 4:1 Pressure Ratio Centrifugal Impeller

This collection features contributions covering the advances and developments of new high-temperature metallurgical technologies and their applications to the areas of: processing of minerals; extraction of metals; preparation of metallic, refractory, and ceramic materials; treatment and recycling of slag and wastes; conservation of energy; and environmental protection. The volume will have a broad impact on the academics and professionals serving the metallurgical industries around the world by providing them with comprehensive coverage of a wide variety of topics.

*Diffusion in metals is an important phenomenon, which has many applications, for example in all kinds of steel and aluminum production, and in alloy formation (technical applications e.g. in superconductivity and semiconductor science). In this book the data on diffusion in metals are shown, both in graphs and in equations. Reliable data on diffusion in metals are required by researchers who try to make sense of results from all kinds of metallurgical experiments, and they are equally needed by theorists and computer modelers. The previous compilation dates from 1990, and measurements relying on the electron microprobe and the recent Rutherford backscattering technique were hardly taken into account there. This reference book, containing all results on self-diffusion and impurity diffusion in pure metals with an indication of their reliability, will be useful to everyone in this field for the theory, fundamental research and industrial applications covered.
• Up-to-date and complete (including EPMA and RBS investigations)
• Indication of reliability of the measurements
• Reassessment of many early results
• Data can easily be extracted from Tables and Graphs*

To classify a book as 'experimental' rather than 'theoretical' or as 'pure' rather than 'applied' is liable to imply umeal distinctions. Nevertheless, some Classification is necessary to tell the potential reader whether the book is for him. In this spirit, this book may be said to treat fluid dynamics as a branch of physics, rather than as a branch of applied mathematics or of engineering. I have often heard expressions of the need for such a book, and certainly I have felt it in my own teaching. I have written it primarily for students of physics and of physics-based applied science, although I hope others may find it useful. The book differs from existing 'fundamental' books in placing much greater emphasis on what we know through laboratory experiments and their physical interpretation and less on the mathe matieal formalism. It differs from existing 'applied' books in that the choice of topics has been made for the insight they give into the behaviour of fluids in motion rather than for their practical importance. There are differences also from many existing books on fluid dynamics in the branches treated, reflecting to some extent shifts of interest in reeent years. In particular, geophysical and astrophysical applications have prompted important fundamental developments in topics such as convection, stratified flow, and the dynamics of rotating fluids. These developments have hitherto been reflected in the contents of textbooks only to a limited extent.

Organic Rankine Cycle (ORC) Power Systems: Technologies and Applications provides a systematic and detailed description of organic Rankine cycle technologies and the way they are increasingly of interest for cost-effective sustainable energy generation. Popular applications include cogeneration from biomass and electricity generation from geothermal reservoirs and concentrating solar power installations, as well as waste heat recovery from gas turbines, internal combustion engines and medium- and low-temperature industrial processes. With hundreds of ORC power systems already in operation and the market growing at a fast pace, this is an active and engaging area of scientific research and technical development. The book is structured in three main parts: (i) Introduction to ORC Power Systems, Design and Optimization, (ii) ORC Plant Components, and (iii) Fields of Application. Provides a thorough introduction to ORC power systems Contains detailed chapters on ORC plant components Includes a section focusing on ORC design and optimization Reviews key applications of ORC technologies, including cogeneration from biomass, electricity generation from geothermal reservoirs and concentrating solar power installations, waste heat recovery from gas turbines, internal combustion engines and medium- and low-temperature industrial processes Various chapters are authored by well-known specialists from Academia and ORC manufacturers

The 3rd International Congress on Energy Efficiency and Energy Related Materials (ENEFFM2015) was held from 19–23 October 2015. This congress focused on the latest developments of sustainable energy technologies, materials for sustainable energy applications and environmental and economic perspectives of energy. These proceedings included 40 peer-reviewed technical papers, submitted by leading academic and research institutions from over 23 countries and represented some of the most cutting-edge researches available. The sections included in the 40 papers are listed as follows: Solar Energy, Fuel cells, Hydrogen productions, Hydrogen storage, Energy storage, Energy saving, Biofuels and Bioenergy, Wind Energy, Nuclear Energy, Fossil Energy, Hydropower, Carbon capture and storage, Materials for renewable energy storage and conversion, Photovoltaics and solar cells, Fuel generation from renewables (catalysis), Carbon dioxide sequestration and conversion, Materials for energy saving, Thermoelectrics, Energy saving in buildings, Bio-Assessment and Toxicology, Air pollution from mobile and stationary sources, Transport of Air Pollutants, Environment-Friendly Construction and Development, Energy Management Systems.

Perovskite and Piezoelectric Materials

Thermal and Electro-thermal System Simulation 2020

3D Microelectronic Packaging

Mechanical Design

Powering the Future of Air Transportation

Theory and Applications

The Idea of India

This book covers diverse aspects of advanced computer and communication engineering, focusing specifically on industrial and manufacturing theory and applications of electronics, communications, computing and information technology. Experts in research, industry, and academia present the latest developments in technology, describe applications, and discuss computer systems and explore likely future directions. In addition, access is offered to numerous new algorithms that assist in solving computer and communication engineering problems. The book is based on presentations delivered at ICOCOE 2014, the 1st International Conference on Communication and Computer Engineering. It will appeal to a wide range of including telecommunication engineers, computer engineers and scientists, researchers, academics and students.

Our rationale for the second edition remains the same as for the first edition, which appeared over twenty years ago. This is to offer simplified, useful and easily understood methods for dealing with the creep of components operating under conditions met in practice. When the first edition was written, we could not claim that the methods were somewhat conjectural, although firmly based, but not sufficiently well developed. Since that time, the Reference Stress Methods (RSM) introduced in the book have received much scrutiny and development. The best recognition we could have of the original methods is the fact that they are now firmly embedded in codes of practice. However, the original objectives. There are major additions to this second edition which should help to justify our claims. These include further clarification regarding Reference Stress Methods in Chapter 4. There are also new topics which depend on RSM in varying degrees:
• Creep fracture is covered in Chapter 7, where methods for assessing creep crack growth are presented.
• This chapter starts with a review of the basic concepts of fracture mechanics and follows with useful, approximate methods, compatible with the needs of design for creep and the availability of standard data.
• Creep/fatigue interactions and environmental effects appear in Chapter 8.

Based on many years of hands-on teaching experience involving students and practicing engineers alike, this text offers an ideal introduction to the design and performance of turbomachinery. Pumps, compressors, and turbines are described in detail, with emphasis on their key features and the flow equations relevant to each part of the machine. The new understanding. Also covered are boundary layer and computational techniques for flow prediction, stability limits, and structural and modal analysis of blades and rotors. Test bed, laboratory, and workshop procedures for turbomachinery development together with instrumentation issues are also covered, drawing on the authors' wide experience. The treatment of turbomachinery types, Introduction to Turbomachinery provides the most up-to-date account of the subject for final-year undergraduates or new graduates beginning a study of turbomachinery, as well as a refresher and reference text for established practitioners.

The series Topics in Current Chemistry Collections presents critical reviews from the journal Topics in Current Chemistry organized in topical volumes. The scope of coverage is all areas of chemical science including the interfaces with related disciplines such as biology, medicine and materials science. The goal of each thematic volume is to provide a comprehensive insight into an area where new research is emerging which is of interest to a larger scientific audience. Each review within the volume critically surveys one aspect of that topic and places it within the context of the volume as a whole. The most significant developments of the last 5 to 10 years are presented under the heading. The coverage is not intended to be an exhaustive summary of the field or include large quantities of data, but should rather be conceptual, concentrating on the methodological thinking that will allow the non-specialist reader to understand the information presented. Contributions also offer an outlook on potential future developments in the field. "Synthetic Tool for Zero and One-Dimensional Titanium Oxide-Based Nano-photocatalysts" is available open access under a CC BY 4.0 License via link.springer.com.

Engineers play a vital role in nation building. Since independence, they have been driving Singapore’s efforts in industrialisation. Their vision, creativity and resilience gave Singapore a competitive edge, enabling a meteoric rise from Third World to First in one generation. Going forward, the government wants to make Singapore a “e;Smart Nation” and fulfilled lives, enabled seamlessly by technology, offering exciting opportunities for all. Engineers are vital in making this happen. This book captures 100 stories of engineering accomplishments in Singapore over a span of 30 years as told by the Nanyang Technological Institute (now known as NTU) Pioneer Engineering Class of 85. They are a testament to the engineering landscape in our nation. If this book inspires some to take up an engineering career, it will have achieved its purpose.

Design Modelling Symposium Paris 2017

Advances in Emerging Trends and Technologies

Computational Fluid Dynamics 2008

Proceedings, Oludeniz, Turkey, 19–23 October 2015

Computer Science for Environmental Engineering and Ecolnformatics

Peppermint Twist

Nobody's Perfect

Origami structures have the ability to be easily fabricated from planar forms, enable the deployment of large structures from small volumes, and are potentially reconfigurable. These characteristics have led to an increased interest in theoretical and computational origami among engineers from across the world. In this book, the principles of origami, active materials, and solid mechanics are combined to present a full theory for origami structures. The focus is on origami structures morphed via active material actuation and formed from sheets of finite thickness. The detailed theoretical derivations and examples make this an ideal book for engineers and advanced students who aim to use origami principles to develop new applications in their field.

A comprehensive reference for engineers and researchers, Gas Turbine Heat Transfer and Cooling Technology, Second Edition has been completely revised and updated to reflect advances in the field made during the past ten years. The second edition retains the format that made the first edition so popular and adds new information mainly based on selected published papers in the open literature. See What's New in the Second Edition: State-of-the-art cooling technologies such as advanced turbine blade film cooling and internal cooling Modern experimental methods for gas turbine heat transfer and cooling research Advanced computational models for gas turbine heat transfer and cooling performance predictions Suggestions for future research in this critical technology The book discusses the need for turbine cooling, gas turbine heat-transfer problems, and cooling methodology and covers turbine rotor and stator heat-transfer issues, including endwall and blade tip regions under engine conditions, as well as under simulated engine conditions. It then examines turbine rotor and stator blade film cooling and discusses the unsteady high free-stream turbulence effect on simulated cascade airfoils. From here, the book explores impingement cooling, rib-turbulent cooling, pin-fin cooling, and compound and new cooling techniques. It also highlights the effect of rotation on rotor coolant passage heat transfer. Coverage of experimental methods includes heat-transfer and mass-transfer techniques, liquid crystal thermography, optical techniques, as well as flow and thermal measurement techniques. The book concludes with discussions of governing equations and turbulence models and their applications for predicting turbine blade heat transfer and film cooling, and turbine blade internal cooling.

This festschrift in honor of Professor Budugur Lakshminarayana's 60th birthday-based on the proceedings of a symposium on Turbomachinery Fluid Dynamics and Heat Transfer held recently at The Pennsylvania State University, University Park-provides authoritative and conclusive research results as well as new insights into complex flow features found in the turbomachinery used for propulsion, power, and industrial applications. Explaining in detail compressors, heat transfer fields in turbines, computational fluid dynamics, and unsteady flows, Turbomachinery Fluid Dynamics and Heat Transfer covers: Mixing mechanisms, annulus wall boundary layers, and the flow field in transonic turbocompressors The numerical implementation of turbulence models in a computer code Secondary flows, film cooling, and thermal turbulence modeling The visualization method of modeling using liquid crystals Innovative techniques in the computational modeling of compressor and turbine flows measurement in unsteady flows as well as axial flows and compressor noise generation And much more Generously illustrated and containing key bibliographic citations, Turbomachinery Fluid Dynamics and Heat Transfer is an indispensable resource for mechanical, design, aerospace, marine, manufacturing, materials, industrial, and reliability engineers; and upper-level undergraduate and graduate students in these disciplines.

Thirty Years Hundred StoriesFlipside Digital Content Company Inc.

Traces the story of the influential 1960s Manhattan nightclub and mobster hangout, detailing how the club's introduction of rock-and-roll music attracted rebel youths and celebrity patrons in an account that also shares colorful stories from the club's history. Co-written by the award-winning co-author of Red: My Uncensored Life in Rock. 30,000 first printing.

8th International Symposium on High-Temperature Metallurgical Processing

The New Machine for Illuminating the Mysteries of Universe

Nonthermal Plasma Chemistry and Physics

Technologies and Applications

Medical Device Design

Thermodynamics and Energy Engineering

3rd International Congress on Energy Efficiency and Energy Related Materials (ENEFM2015)

This book focuses on the two-phase flow problems relevant in the automotive and power generation sectors. It includes fundamental studies on liquid–gas two-phase interactions, nucleate and film boiling, condensation, cavitation, suspension flows as well as the latest developments in the field of two-phase problems pertaining to power generation systems. It also discusses the latest analytical, numerical and experimental techniques for investigating the role of two-phase flows in performance analysis of devices like combustion engines, gas turbines, nuclear reactors and fuel cells. The wide scope of applications of this topic makes this book of interest to researchers and professionals alike.

This book, edited by Prof. Marta Rencz and Prof Andras Poppe, Budapest University of Technology and Economics, and by Prof. Lorenzo Codecasa, Politecnico di Milano, collects fourteen papers carefully selected for the “thermal and electro-thermal system simulation” Special Issue of Energies. These contributions present the latest results in a currently very “hot” topic in electronics: the thermal and electro-thermal simulation of electronic components and systems. Several papers here proposed have turned out to be extended versions of papers presented at THERMINIC 2019, which was one of the 2019 stages of choice for presenting outstanding contributions on thermal and electro-thermal simulation of electronic systems. The papers proposed to the thermal community in this book deal with modeling and simulation of state-of-the-art applications which are highly critical from the thermal point of view, and around which there is great research activity in both industry and academia. In particular, contributions are proposed on the multi-physics simulation of families of electronic packages, multi-physics advanced modeling in power electronics, multiphysics modeling and simulation of LEDs, batteries and other micro and nano-structures.

This book provides a broad introduction to the physics and technology of the High Luminosity Large Hadron Collider (HL-LHC). This new configuration of the LHC is one of the major accelerator projects for the next 20 years and will give new life to the LHC after its first 15-year operation. Not only will it allow more precise measurements of the Higgs boson and of any new particles that might be discovered in the next LHC run, but also extend the mass limit reach for detecting new particles. The HL-LHC is based on the innovative accelerator magnet technologies capable of generating 11–13 Tesla fields, with effectiveness enhanced by use of the new Achromatic Telescopic Squeezing scheme, and other state-of-the-art accelerator technologies, such as superconducting compact RF crab cavities, advanced collimation concepts, and novel power technology based on high temperature superconducting links. The book consists of a series of chapters touching on all issues of technology and design, and each chapter can be read independently. The first few chapters give a summary of the whole project, of the physics motivation and of the accelerator challenges. The subsequent chapters cover the novel technologies, the new configurations of LHC and of its injectors as well as the expected operational implications. Altogether, the book brings the reader to the heart of technologies for the leading edge accelerator and gives insights into next generation hadron colliders.

This book is a primary survey of basic thermodynamic concepts that will allow one to predict states of a fuel cell system, including potential, temperature, pressure, volume and moles. The specific topics explored include enthalpy, entropy, specific heat, Gibbs free energy, net output voltage irreversible losses in fuel cells and fuel cell efficiency. It contains twelve chapters organized into two sections on “Theoretical Models” and “Applications.” The specific topics explored include enthalpy, entropy, specific heat, Gibbs free energy, net output voltage irreversible losses in fuel cells and fuel cell efficiency.

Providing a clear and systematic description of droplets and spray dynamic models, this book maximises reader insight into the underlying physics of the processes involved, outlines the development of new physical and mathematical models and broadens understanding of interactions between the complex physical processes which take place in sprays. ComPLEMENTING approaches based on the direct application of computational fluid dynamics (CFD), Droplets and Sprays treats both theoretical and practical aspects of internal combustion engine process such as the direct injection of liquid fuel, subcritical heating and evaporation. Including case studies that illustrate the approaches relevance to automotive applications, it is also anticipated that the described models can find use in other areas such as in medicine and environmental science.

Physical Fluid Dynamics

The Mob, the Music, and the Most Famous Dance Club of the '60s

Thirty Years Hundred Stories

Advanced Computer and Communication Engineering Technology

Humanizing Digital Reality

Experimental Approaches of NMR Spectroscopy

International Workshop, CSEEE 2011, Kunming, China, July 29-30, 2011. Proceedings

Since 1976, the Vibrations in Rotating Machinery conferences have successfully brought industry and academia together to advance state-of-the-art research in dynamics of rotating machinery. 12th International Conference on Vibrations in Rotating Machinery contains contributions presented at the 12th edition of the conference, from industrial and academic experts from different countries. The book discusses the challenges in rotor-dynamics, rub, whirl, instability and more. The topics addressed include: - Active, smart vibration control - Rotor balancing, dynamics, and smart rotors - Bearings and seals - Noise vibration and harshness - Active and passive damping - Applications: wind turbines, steam turbines, gas turbines, compressors - Joints and couplings - Challenging performance boundaries of rotating machines - High power density machines - Electrical machines for aerospace - Management of extreme events - Active machines - Electric supercharging - Blades and bladed assemblies (forced response, flutter, mistuning) - Fault detection and condition monitoring - Rub, whirl and instability - Torsional vibration Providing the latest research and useful guidance, 12th International Conference on Vibrations in Rotating Machinery aims at those from industry or academia that are involved in transport, power, process, medical engineering, manufacturing or construction.

"Having been born a freeman, and for more than thirty years enjoyed the blessings of liberty in a free State—and having at the end of that time been kidnapped and sold into Slavery, where I remained, until happily rescued in the month of January, 1853, after a bondage of twelve years—it has been suggested that an account of my life and fortunes would not be uninteresting to the public." -an excerpt

This book highlights recent findings in industrial, manufacturing and mechanical engineering, and provides an overview of the state of the art in these fields, mainly in Russia and Eastern Europe. A broad range of topics and issues in modern engineering is discussed, including the dynamics of machines and working processes, friction, wear and lubrication in machines, surface transport and technological machines, manufacturing engineering of industrial facilities, materials engineering, metallurgy, control systems and their industrial applications, industrial mechatronics, automation and robotics. The book gathers selected papers presented at the 7th International Conference on Industrial Engineering (ICIE), held in Sochi, Russia, in May 2021. The authors are experts in various fields of engineering, and all papers have been carefully reviewed. Given its scope, the book will be of interest to a wide readership, including mechanical and production engineers, lecturers in engineering disciplines, and engineering graduates.

What are the benefits of electrified propulsion for large aircraft? What technology advancements are required to realize these benefits? How can the aerospace industry transition from today's technologies to state-of-the-art electrified systems? Learn the answers with this multidisciplinary text, combining expertise from leading researchers in electrified aircraft propulsion. The book includes broad coverage of electrification technologies – spanning power systems and power electronics, materials science, superconductivity and cryogenics, thermal management, battery chemistry, system design, and system optimization – and a clear-cut road map identifying remaining gaps between the current state-of-the-art and future performance technologies. Providing expert guidance on areas for future research and investment and an ideal introduction to cutting-edge advances and outstanding challenges in large electric aircraft design, this is a perfect resource for graduate students, researchers, electrical and aeronautical engineers, policymakers, and management professionals interested in next-generation commercial flight technologies.

The Detroit Tigers, an umpire, a pitcher, and a mistake—one of the “classic, human, baseball stories” (Ken Burns, creator of the PBS mini-series Baseball). The perfect game is one of the rarest accomplishments in sports. In nearly four hundred thousand contests in over 130 years, it has happened only twenty times. On June 2, 2010, Armando Galarraga threw baseball’s twenty-first. Except that’s not how it entered the record books. That’s because Jim Joyce, voted the best umpire in the game in 2010 and 2011, missed the call on the final out. But rather than throwing a tantrum, Galarraga simply turned and smiled, went back to the mound, and finished the game. “Nobody’s perfect,” he said later in the locker room. “You might think everything that could have been said, replayed, and revealed about that night has already been uttered, logged, and exposed. You would, however, be as wrong as the unfortunate Mr. Joyce” (The Detroit News). In Nobody’s Perfect, Galarraga and Joyce come together to tell the personal story of a remarkable game that will live forever in baseball lore, and to trace their fascinating lives in sports. The result is “a masterpiece”, an absorbing insider’s look at two careers in baseball, a tremendous achievement, and an enduring moment of pure grace and sportsmanship (The Huffington Post).

Modeling, Design, and Applications

Twelve Years a Slave

X-Ray and Neutron Dynamical Diffraction

Computer Methods in Biomechanics and Biomedical Engineering

Proceedings of the 12th Virtual Conference on Vibrations in Rotating Machinery (VIRM), 14-15 October 2020

Droplets and Sprays

Two Men, One Call, and a Game for Baseball History

This two-volume set (CCIS 158 and CCIS 159) constitutes the refereed proceedings of the International Workshop on Computer Science for Environmental Engineering and Ecolnformatics, CSEEE 2011, held in Kunming, China, in July 2011. The 150 revised full papers presented in both volumes were carefully reviewed and selected from a large number of submissions.

The papers are organized in topical sections on computational intelligence; computer simulation; computing practices and applications; ecoinformatics; image processing information retrieval; pattern recognition; wireless communication and mobile computing; artificial intelligence and pattern classification; computer networks and Web; computer software, data handling and applications; data communications; data mining; data processing and simulation; information systems; knowledge data engineering; multimedia applications.

Practical Estimation of Propulsive Power

Handbook of Experimental Data

Active Origami

From Fundamentals to Applications

