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## Fused Deposition Modeling Based 3D Printing

**Springer Nature** *This book covers 3D printing activities by fused deposition modeling process. The two introductory chapters discuss the principle, types of machines and raw materials, process parameters, defects, design variations and simulation methods. Six chapters are devoted to experimental work related to process improvement, mechanical testing and characterization of the process, followed by three chapters on post-processing of 3D printed components and two chapters addressing sustainability concerns. Seven chapters discuss various applications including composites, external medical devices, drug delivery system, orthotic inserts, watertight components and 4D printing using FDM process. Finally, six chapters are dedicated to the study on modeling and optimization of FDM process using computational models, evolutionary algorithms, machine learning, metaheuristic approaches and optimization of layout and tool path.*

## High-precision 3D-coordinate Measuring Machine

## Design and Prototype-development

## Tunnel Fire Dynamics

**Springer** *This book covers a wide range of issues in fire safety engineering in tunnels, describes the phenomena related to tunnel fire dynamics, presents state-of-the-art research, and gives detailed solutions to these major issues. Examples for calculations are provided. The aim is to significantly improve the understanding of fire safety engineering in tunnels. Chapters on fuel and ventilation control, combustion products, gas temperatures, heat fluxes, smoke stratification, visibility, tenability, design fire curves, heat release, fire suppression and detection, CFD modeling, and scaling techniques all equip readers to create their own fire safety plans for tunnels. This book should be purchased by any engineer or public official with responsibility for tunnels. It would also be of interest to many fire protection engineers as an application of evolving technical principles of fire safety.*

## Proceeding of International Conference on Intelligent Communication, Control and Devices

## ICICCD 2016

**Springer** *The book presents high-quality research papers presented at the first international conference, ICICCD 2016, organised by the Department of Electronics, Instrumentation and Control Engineering of University of Petroleum and Energy Studies, Dehradun on 2nd and 3rd April, 2016. The book is broadly divided into three sections: Intelligent Communication, Intelligent Control and Intelligent Devices. The areas covered under these sections are wireless communication and radio technologies, optical communication, communication hardware evolution, machine-to-machine communication networks, routing techniques, network analytics, network applications and services, satellite and space communications, technologies for e-communication, wireless Ad-Hoc and sensor networks, communications and information security, signal processing for communications, communication software, microwave informatics, robotics and automation, optimization techniques and algorithms, intelligent transport, mechatronics system, guidance and navigation, algorithms, linear/non-linear control, home automation, sensors, smart cities, control systems, high performance computing, cognition control, adaptive control, distributed control, prediction models, hybrid control system, control applications, power system, manufacturing, agriculture cyber physical system, network control system, genetic control based, wearable devices, nano devices, MEMS, bio-inspired computing, embedded and real-time software, VLSI and embedded systems, FPGA, digital system and logic design, image and video processing, machine vision, medical imaging, and reconfigurable computing systems.*

## Handbook of Atomization and Sprays

## Theory and Applications

**Springer Science & Business Media** *Atomization and sprays are used in a wide range of industries: mechanical, chemical, aerospace, and civil engineering; material science and metallurgy; food; pharmaceutical, forestry, environmental protection; medicine; agriculture; meteorology and others. Some specific applications are spray combustion in furnaces, gas turbines and rockets, spray drying and cooling, air conditioning, powdered metallurgy, spray painting and coating, inhalation therapy, and many others. The Handbook of Atomization and Sprays will bring together the fundamental and applied material from all fields into one comprehensive source. Subject areas included in the reference are droplets, theoretical models and numerical simulations, phase Doppler particle analysis, applications, devices and more.*

## Off the Network

## Disrupting the Digital World

**U of Minnesota Press** *The digital world profoundly shapes how we work and consume and also how we play, socialize, create identities, and engage in politics and civic life. Indeed, we are so enmeshed in digital networks—from social media to cell phones—that it is hard to conceive of them from the outside or to imagine an alternative, let alone defy their seemingly inescapable power and logic. Yes, it is (sort of) possible to quit Facebook. But is it possible to disconnect from the digital network—and why might we want to? Off the Network is a fresh and authoritative examination of how the hidden logic of the Internet, social media, and the digital network is changing users' understanding of the world—and why that should worry us. Ulises Ali Mejias also suggests how we might begin to rethink the logic of the network and question its ascendancy. Touted as consensual, inclusive, and pleasurable, the digital network is also, Mejias says, monopolizing and threatening in its capacity to determine, commodify, and commercialize so many aspects of our lives. He shows how the network broadens participation yet also exacerbates disparity—and how it excludes more of society than it includes. Uniquely, Mejias makes the case that it is not only necessary to challenge the privatized and commercialized modes of social and civic life offered by corporate-controlled spaces such as Facebook and Twitter, but that such confrontations can be mounted from both within and outside the network. The result is an uncompromising, sophisticated, and accessible critique of the digital world that increasingly dominates our lives.*

## OpenFOAM®

## Selected Papers of the 11th Workshop

**Springer** *This book contains selected papers of the 11th OpenFOAM® Workshop that was held in Guimarães, Portugal, June 26 - 30, 2016. The 11th OpenFOAM® Workshop had more than 140 technical/scientific presentations and 30 courses, and was attended by circa 300 individuals, representing 180 institutions and 30 countries, from all continents. The OpenFOAM® Workshop provided a forum for researchers, industrial users, software developers, consultants and academics working with OpenFOAM® technology. The central part of the Workshop was the two-day conference, where presentations and posters on industrial applications and academic research were shown. OpenFOAM® (Open Source Field Operation and Manipulation) is a free, open source computational toolbox that has a larger user base across most areas of engineering and science, from both commercial and academic organizations. As a technology, OpenFOAM® provides an extensive range of features to solve anything from complex fluid flows involving chemical reactions, turbulence and heat transfer, to solid dynamics and electromagnetics, among several others. Additionally, the OpenFOAM technology offers complete freedom to customize and extend its functionalities.*

## Two-Phase Flow for Automotive and Power Generation Sectors

**Springer** *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.*

# Recent Trends in Fuel Cell Science and Technology

**Springer Science & Business Media** *This book covers all the proposed fuel cell systems including PEMFC, SOFC, PAFC, MCFC, regenerative fuel cells, direct alcohol fuel cells, and small fuel cells to replace batteries.*

# Information Modeling for Interoperable Dimensional Metrology

**Springer Science & Business Media** *Dimensional metrology is an essential part of modern manufacturing technologies, but the basic theories and measurement methods are no longer sufficient for today's digitized systems. The information exchange between the software components of a dimensional metrology system not only costs a great deal of money, but also causes the entire system to lose data integrity. Information Modeling for Interoperable Dimensional Metrology analyzes interoperability issues in dimensional metrology systems and describes information modeling techniques. It discusses new approaches and data models for solving interoperability problems, as well as introducing process activities, existing and emerging data models, and the key technologies of dimensional metrology systems. Written for researchers in industry and academia, as well as advanced undergraduate and postgraduate students, this book gives both an overview and an in-depth understanding of complete dimensional metrology systems. By covering in detail the theory and main content, techniques, and methods used in dimensional metrology systems, Information Modeling for Interoperable Dimensional Metrology enables readers to solve real-world dimensional measurement problems in modern dimensional metrology practices.*

# Advances in Mechanical Engineering

# Select Proceedings of ICAME 2020

**Springer Nature** *This book presents select peer-reviewed proceedings of the International Conference on Advances in Mechanical Engineering (ICAME 2020). The contents cover latest research in several areas such as advanced energy sources, automation, mechatronics and robotics, automobiles, biomedical engineering, CAD/CAM, CFD, advanced engineering materials, mechanical design, heat and mass transfer, manufacturing and production processes, tribology and wear, surface engineering, ergonomics and human factors, artificial intelligence, and supply chain management. The book brings together advancements happening in the different domains of mechanical engineering, and hence, this will be useful for students and researchers working in mechanical engineering.*

# Fatigue under Thermal and Mechanical Loading: Mechanisms, Mechanics and Modelling

**Springer Science & Business Media** *The International Symposium "Fatigue under Thermal and Mechanical Loading", held at Petten (The Netherlands) on May 22-24, 1995, was jointly organized by the Institute for Advanced Materials of The Joint Research Centre, E. C. , and by the Societe Fran~se de Metallurgie et de Materiaux. The fast heating and cooling cycles experienced by many high temperature components cause thermally induced stresses, which often operate in combination with mechanical loads. The resulting thermal / mechanical fatigue cycle leads to material degradation mechanisms and failure modes typical of service cycles. The growing awareness that the synergism between the combined thermal and mechanical loads can not be reproduced by means of isothermal tests, has resulted in an increasing interest in thermal and thermo-mechanical fatigue testing. This trend has been reinforced by the constant pull by industry for more performant, yet safer high temperature systems, pushing the materials to the limit of their properties. Dedicated ASTM meetings in particular have set the scene for this area of research. The proceedings of the symposium organized by D. A. Spera and D. F. Mowbray in 1975 provided a reference book on thermal fatigue which reflects the knowledge and experimental capabilities of the mid-seventies.*

# Machining Dynamics

# Fundamentals, Applications and Practices

**Springer Science & Business Media** *Machining dynamics play an essential role in the performance of the machine tools and machining processes which directly affect the removal rate, workpiece surface quality and dimensional and form accuracy. Machining Dynamics: Fundamentals and Applications will be bought by advanced undergraduate and postgraduate students studying manufacturing engineering and machining technology in addition to manufacturing engineers, production supervisors, planning and application engineers, and designers.*

# Sound Propagation

# An Impedance Based Approach

**John Wiley & Sons** *In Sound Propagation: An Impedance Based Approach, Professor Yang-Hann Kim introduces acoustics and sound fields by using the concept of impedance. Kim starts with vibrations and waves, demonstrating how vibration can be envisaged as a kind of wave, mathematically and physically. One-dimensional waves are used to convey the fundamental concepts. Readers can then understand wave propagation in terms of characteristic and driving point impedance. The essential measures for acoustic waves, such as dB scale, octave scale, acoustic pressure, energy, and intensity, are explained. These measures are all realized by one-dimensional examples, which provide mathematically simplest but clear enough physical insights. Kim then moves on to explaining waves on a flat surface of discontinuity, demonstrating how propagation characteristics of waves change in space when there is a distributed impedance mismatch. Next is a chapter on radiation, scattering, and diffraction, where Kim shows how these topics can be explained in a unified way, by seeing the changes of waves due to spatially distributed impedance. Lastly, Kim covers sound in closed space, which is considered to be a space that is surrounded by spatially distributed impedance, and introduces two spaces: acoustically large and small space. The bulk of the book is concerned with introducing core fundamental concepts, but the appendices are included as the essentials as well to cover other important topics to extend learning. Offers a less mathematically-intensive means to understand the subject matter Provides an excellent launching point for more advanced study or for review of the basics Based on classroom tested materials developed over the course of two decades Companion site for readers, containing animations and MATLAB code downloads Videos and impedance data available from the author's website Presentation slides available for instructor use Sound Propagation is geared towards graduate students and advanced undergraduates in acoustics, audio engineering, and noise control engineering. Practicing engineers and researchers in audio engineering and noise control, or students in engineering and physics disciplines, who want to gain an understanding of sound and vibration concepts, will also find the book to be a helpful resource.*

# Computational Fluid Dynamics

# Incompressible Turbulent Flows

**Springer** *This textbook presents numerical solution techniques for incompressible turbulent flows that occur in a variety of scientific and engineering settings including aerodynamics of ground-based vehicles and low-speed aircraft, fluid flows in energy systems, atmospheric flows, and biological flows. This book encompasses fluid mechanics, partial differential equations, numerical methods, and turbulence models, and emphasizes the foundation on how the governing partial differential equations for incompressible fluid flow can be solved numerically in an accurate and efficient manner. Extensive discussions on incompressible flow solvers and turbulence modeling are also offered. This text is an ideal instructional resource and reference for students, research scientists, and professional engineers interested in analyzing fluid flows using numerical simulations for fundamental research and industrial applications.*

# Systems Modeling and Simulation: Theory and Applications

# Third Asian Simulation Conference, AsiaSim 2004, Jeju Island, Korea, October 4-6, 2004, Revised Selected Papers

**Springer Science & Business Media** *This book constitutes the refereed post-proceedings of the third Asian Simulation Conference, AsiaSim 2004, held in Jeju Island, Korea in October 2004. The 78 revised full papers presented together with 2 invited keynote papers were carefully reviewed and selected from 178 submissions; after the conference, the papers went through another round of revision. The papers are organized in topical sections on modeling and simulation methodology, manufacturing, aerospace simulation, military simulation, medical simulation, general applications, network simulation and modeling, e-business simulation, numerical simulation, traffic simulation, transportation, virtual reality, engineering applications, and DEVS modeling and simulation.*

# Three-Dimensional Computer Vision

**Springer Science & Business Media** *The purpose of computer vision is to make computers capable of understanding environments from visual information. Computer vision has been an interesting theme in the field of artificial intelligence. It involves a variety of intelligent information processing: both pattern processing for extraction of meaningful symbols from visual information and symbol processing for determining what the symbols represent. The term "3D computer vision" is used if visual information has to be interpreted as three-dimensional scenes. 3D computer vision is more challenging because objects are seen from limited directions and some objects are occluded by others. In 1980, the author wrote a book "Computer Vision" in Japanese to introduce an interesting new*

approach to visual information processing developed so far. Since then computer vision has made remarkable progress: various rangefinders have become available, new methods have been developed to obtain 3D informa tion, knowledge representation frameworks have been proposed, geometric models which were developed in CAD/CAM have been used for computer vision, and so on. The progress in computer vision technology has made it possible to understand more complex 3 D scenes. There is an increasing demand for 3D computer vision. In factories, for example, automatic assembly and inspection can be realized with fewer con straints than conventional ones which employ two-dimensional computer vision.

# Fluid Machinery and Fluid Mechanics

# 4th International Symposium (4th ISFMFE)

**Springer Science & Business Media** "Fluid Machinery and Fluid Mechanics: 4th International Symposium (4th ISFMFE)" is the proceedings of 4th International Symposium on Fluid Machinery and Fluid Engineering, held in Beijing November 24-27, 2008. It contains 69 highly informative technical papers presented at the Mei Lecture session and the technical sessions of the symposium. The Chinese Society of Engineering Thermophysics (CSET) organized the First, the Second and the Third International Symposium on Fluid Machinery and Fluid Engineering (1996, 2000 and 2004). The purpose of the 4th Symposium is to provide a common forum for exchange of scientific and technical information worldwide on fluid machinery and fluid engineering for scientists and engineers. The main subject of this symposium is "Fluid Machinery for Energy Conservation". The "Mei Lecture" reports on the most recent developments of fluid machinery in commemoration of the late professor Mei Zuyan. The book is intended for researchers and engineers in fluid machinery and fluid engineering. Jianzhong Xu is a professor at the Chinese Society of Engineering Thermophysics, Chinese Academy of Sciences, Beijing.

# Recent Advances in Structural Integrity Analysis - Proceedings of the International Congress (APCF/SIF-2014)

# (APCFS/SIF 2014).

The proceedings of the International Congress (c) include about 120 papers selected out of 160 papers submitted for presentations at APCF/SIF-2014, to be held in Sydney, Australia, December 9-12, 2014, and uniting the Asian-Pacific Conference on Fracture and Strength 2014 (APCFS-2014) with the International Conference on Structural Integrity and Failure (SIF-2014). The congress will be hosted by The University of Sydney and co-organized by Australia Fracture Group (AFG), the Chinese Mechanical Engineering Society, Materials Institution (CMES-MI), the Korean Society of Mechanical Engineers, Ma.

# Recent Trends in Mechatronics Towards Industry 4.0

# Selected Articles from iM3F 2020, Malaysia

**Springer Nature** This book presents part of the iM3F 2020 proceedings from the Mechatronics track. It highlights key challenges and recent trends in mechatronics engineering and technology that are non-trivial in the age of Industry 4.0. It discusses traditional as well as modern solutions that are employed in the multitude spectra of mechatronics-based applications. The readers are expected to gain an insightful view on the current trends, issues, mitigating factors as well as solutions from this book.

# Flow-Based Optimization of Products or Devices

**MDPI** Flow-based optimization of products and devices is an immature field compared to the corresponding topology optimization based on solid mechanics. However, it is an essential part of component development with both internal and/or external flow. The aim of this book is two-fold: (i) to provide state-of-the-art examples of flow-based optimization and (ii) to present a review of topology optimization for fluid-based problems.

# Steam Generators for Nuclear Power Plants

**Woodhead Publishing** Steam Generators for Nuclear Power Plants examines all phases of the lifecycle of nuclear steam generators (NSGs), components which are essential for the efficient and safe operation of light water reactors (LWRs). Coverage spans the design, manufacturing, operation and maintenance, fitness-for-service, and long-term operation of these key reactor parts. Part One opens with a chapter that provides fundamental background on NSG engineering and operational experiences. Following chapters review the different NSG concepts, describe NSG design and manufacturing, and consider the particularities of SGs for VVER reactors. Part Two focuses on NSG operation and maintenance, starting with an overview of the activities required to support reliable and safe operation. The discussion then moves on to tubing vibration, followed by the water and steam cycle chemistry issues relevant to the NSG lifecycle. Finally, a number of chapters focus on the key issue of corrosion in NSGs from different angles. This book serves as a timely resource for professionals involved in all phases of the NSG lifecycle, from design, manufacturing, operation and maintenance, to fitness-for-service and long-term operation. It is also intended as a valuable resource for students and researchers interested in a range of topics relating to NSG lifecycle management. Fulfills the need for a detailed reference on steam generators for nuclear power plants Contains comprehensive coverage of all phases of the nuclear steam generator lifecycle, from design, manufacturing, operation and maintenance, to fitness-for-service and long-term operation in one convenient volume Presents contributions from key manufacturers and research institutes and universities

# Applied Mechanics Reviews

# IUTAM Symposium on Topological Design Optimization of Structures, Machines and Materials

# Status and Perspectives

**Springer Science & Business Media** This volume offers edited papers presented at the IUTAM-Symposium Topological design optimization of structures, machines and materials - status and perspectives, October 2005. The papers cover the application of topological design optimization to fluid-solid interaction problems, acoustics problems, and to problems in biomechanics, as well as to other multiphysics problems. Also in focus are new basic modelling paradigms, covering new geometry modelling such as level-set methods and topological derivatives.

# Fused Deposition Modeling

# Strategies for Quality Enhancement

**Springer Nature** In this book, fused deposition modeling (FDM) is described with focus on product quality control and enhancement. The book begins by introducing the basics of FDM and its associated process parameters. Then, strategies for quality control and enhancement are described using case studies of both original results by the authors and from published literature. Resolution and print orientation, multi-objective optimizations and surface engineering are identified and discussed as the strategies for enhancing the quality of FDM products in this book.

# Handbook of Digital Innovation

**Edward Elgar Publishing** Digital innovations influence every aspect of life in an increasingly digitalized world. Firms pursuing digital innovations must consider how digital technologies shape the nature, process and outcomes of innovation as well as long- and short-term social, economic and cultural consequences of their offerings. This Handbook contributes to a transdisciplinary understanding of digital innovation with a diverse set of leading scholars and their distinct perspectives. The ideas and principles advanced herein set the agenda for future transdisciplinary research on digital innovation in ways that inform not only firm-level strategies and practices but also policy decisions and science-focused investments.

# Particle Image Velocimetry

**Cambridge University Press** Particle image velocimetry, or PIV, refers to a class of methods used in experimental fluid mechanics to determine instantaneous fields of the vector velocity by measuring the displacements of numerous fine particles that accurately follow the motion of the fluid. Although the concept of measuring particle displacements is simple in essence, the factors that need to be addressed to design and implement PIV systems that achieve reliable, accurate, and fast measurements and to interpret the results are surprisingly numerous. The aim of this book is to analyze and explain them comprehensively.

# Journal-Bearing Databook

**Springer Science & Business Media** *Journal bearings, which are used in all kinds of rotating machinery, do not only support static loads, such as the weight of rotors and load caused by transmitted torque of reduction gears, but are, in addition almost the only machine element that is able to suppress various exciting forces acting on the rotating shaft. As rotating machines have become large and multi-staged, while compactness, high speed, and high output have also been realized in recent years, not only has the bearing load increased, but also the magnitude and variety of exciting forces. Therefore, the role and importance of journal bearings have increased tremendous ly. In particular, for the design of rotating machines with low vibration levels and high reliability, knowledge of the exact characteristic data of bearings, and especial ly of the stiffness or spring coefficients and the damping coefficients of oil films in bearings, is essential. However, the amount of reliable data now applicable to practical design is limited. Through the activity of the Research Subcommittee on Dynamic Charac teristics of Journal Bearings and Their Applications (designated as PSC 28), estab lished and organized in June 1979 through May 1982 within the Japan Society of Mechanical Engineers (JSME), these coefficients, together with static characteris tics, have been calculated and also measured on a number of new test rigs.*

# LINEAR ALGEBRA

# A GEOMETRIC APPROACH

**PHI Learning** *This clear, concise and highly readable text is designed for a first course in linear algebra and is intended for undergraduate courses in mathematics. It focusses throughout on geometric explanations to make the student perceive that linear algebra is nothing but analytic geometry of n dimensions. From the very start, linear algebra is presented as an extension of the theory of simultaneous linear equations and their geometric interpretation is shown to be a recurring theme of the subject. The integration of abstract algebraic concepts with the underlying geometric notions is one of the most distinguishing features of this book — designed to help students in the pursuit of multivariable calculus and differential geometry in subsequent courses.Explanations and concepts are logically presented in a conversational tone and well-constructed writing style so that students at a variety of levels can understand the material and acquire a solid foundation in the basic skills of linear algebra.*

# 1998 ASME Boiler and Pressure Vessel Code

# Section V : Nondestructive Examination

# Shape-Memory Polymers

**Springer** *Table of Contents -Shape-Memory Polymers and Shape-Changing Polymers By M. Behl, J. Zotzmann, and A. Lendlein -Shape-Memory Polymer Composites By Samy A. Madbouly and Andreas Lendlein -Characterization Methods for Shape-Memory Polymers By W. Wagermaier, K. Kratz, M. Heuchel, and A. Lendlein -Shape-Memory Polymers for Biomedical Applications By Christopher M. Yakacki and Ken Gall -Controlled Drug Release from Biodegradable Shape-Memory Polymers By ChristianWischke, Axel T. Neffe, and Andreas Lendlein*

# Advanced Machining Processes of Metallic Materials

# Theory, Modelling, and Applications

**Elsevier** *Advanced Machining Processes of Metallic Materials: Theory, Modelling and Applications, Second Edition, explores the metal cutting processes with regard to theory and industrial practice. Structured into three parts, the first section provides information on the fundamentals of machining, while the second and third parts include an overview of the effects of the theoretical and experimental considerations in high-level machining technology and a summary of production outputs related to part quality. In particular, topics discussed include: modern tool materials, mechanical, thermal and tribological aspects of machining, computer simulation of various process phenomena, chip control, monitoring of the cutting state, progressive and hybrid machining operations, as well as practical ways for improving machinability and generation and modeling of surface integrity. This new edition addresses the present state and future development of machining technologies, and includes expanded coverage on machining operations, such as turning, milling, drilling, and broaching, as well as a new chapter on sustainable machining processes. In addition, the book provides a comprehensive description of metal cutting theory and experimental and modeling techniques, along with basic machining processes and their effective use in a wide range of manufacturing applications. The research covered here has contributed to a more generalized vision of machining technology, including not only traditional manufacturing tasks, but also potential (emerging) new applications, such as micro and nanotechnology. Includes new case studies illuminate experimental methods and outputs from different sectors of the manufacturing industry Presents metal cutting processes that would be applicable for various technical, engineering, and scientific levels Includes an updated knowledge of standards, cutting tool materials and tools, new machining technologies, relevant machinability records, optimization techniques, and surface integrity*

# Uncertainty Quantification in Laminated Composites

# A Meta-model Based Approach

**CRC Press** *Over the last few decades, uncertainty quantification in composite materials and structures has gained a lot of attention from the research community as a result of industrial requirements. This book presents computationally efficient uncertainty quantification schemes following meta-model-based approaches for stochasticity in material and geometric parameters of laminated composite structures. Several metamodels have been studied and comparative results have been presented for different static and dynamic responses. Results for sensitivity analyses are provided for a comprehensive coverage of the relative importance of different material and geometric parameters in the global structural responses.*

# Advances in Lithium Isotope Geochemistry

**Springer** *This work summarizes the historical progression of the field of lithium (Li) isotope studies and provides a comprehensive yet succinct overview of the research applications toward which they have been directed. In synthesizing the historical and current research, the volume also suggests prospective future directions of study. Not even a full decade has passed since the publication of a broadly inclusive summary of Li isotope research around the globe (Tomascak, 2004). In this short time, the use of this isotope system in the investigation of geo- and cosmochemical questions has increased dramatically, due, in part, to the advent of new analytical technology at the end of the last millennium. Lithium, as a light element that forms low-charge, moderate-sized ions, manifests a number of chemical properties that make its stable isotope system useful in a wide array of geo- and cosmochemical research fields.*

# Machining of Metal Matrix Composites

**Springer Science & Business Media** *Machining of Metal Matrix Composites provides the fundamentals and recent advances in the study of machining of metal matrix composites (MMCs). Each chapter is written by an international expert in this important field of research. Machining of Metal Matrix Composites gives the reader information on machining of MMCs with a special emphasis on aluminium matrix composites. Chapter 1 provides the mechanics and modelling of chip formation for traditional machining processes. Chapter 2 is dedicated to surface integrity when machining MMCs. Chapter 3 describes the machinability aspects of MMCs. Chapter 4 contains information on traditional machining processes and Chapter 5 is dedicated to the grinding of MMCs. Chapter 6 describes the dry cutting of MMCs with SiC particulate reinforcement. Finally, Chapter 7 is dedicated to computational methods and optimization in the machining of MMCs. Machining of Metal Matrix Composites can serve as a useful reference for academics, manufacturing and materials researchers, manufacturing and mechanical engineers, and professionals involved with MMC applications. It can also be used to teach modern manufacturing engineering or as a textbook for advanced undergraduate and postgraduate engineering courses in machining, manufacturing or materials.*

# Advances in Technical Diagnostics

# Proceedings of the 6th International Congress on Technical Diagnostic, ICDT2016, 12 - 16 September 2016, Gliwice, Poland

**Springer** *This book provides readers with an overview of recent theories and methods for machinery diagnostics applied to machinery maintenance. Each chapter, accepted after a rigorous peer-review process, reports on a selected, original piece of work discussed at the International Congress on Technical Diagnostic, ICDT2016, held on September 12 – 16, 2016, in Gliwice, Poland. The book covers a broad range of topics, including machines operating in non-stationary conditions, and examples from different industrial fields of mechanical, civil, computer and electronic engineering as well as the medical, food, automotive, and mining industries. By presenting state-of-the-art diagnostic solutions and discussing important industrial issues the book offers a valuable resource to both academics and professionals as well as a bridge to facilitate communication and collaboration between the two groups.*

# Residual Stresses 2018

## ECRS-10

**Materials Research Forum LLC** *The European Conference on Residual Stresses (ECRS) series is the leading European forum for scientific exchange on internal and residual stresses in materials. It addresses both academic and industrial experts and covers a broad gamut of stress-related topics from instrumentation via experimental and modelling methodology up to stress problems in specific processes such as welding or shot-peening, and their impact on materials properties. Chapters: Diffraction Methods; Mechanical Relaxation Methods; Acoustic and Electromagnetic Methods; Composites, Nano and Microstructures; Films, Coatings and Oxides; Cold Working and Machining; Heat Treatments and Phase Transformations; Welding, Fatigue and Fracture: Stresses in Additive Manufacturing.*

## Composites and Their Applications

**IntechOpen** *Composites are a class of material, which receives much attention not only because it is on the cutting edge of active material research fields due to appearance of many new types of composites, e.g., nanocomposites and bio-medical composites, but also because there are a great deal of promise for its potential applications in various industries ranging from aerospace to construction due to its various outstanding properties. This book mainly describes some potential applications and the related properties of various composites by focusing on the following several topics: health or integrity monitoring techniques of composites structures, bio-medical composites and their applications in dental or tissue materials, natural fiber or mineral filler reinforced composites and their property characterization, catalysts composites and their applications, and some other potential applications of fibers or composites as sensors, etc. This book has been divided into five sections to cover the above contents.*

## Management, Recycling and Reuse of Waste Composites

**Elsevier** *This authoritative reference work provides a comprehensive review of the management, recycling and reuse of waste composites. These are issues which are of increasing importance due to the growing use of composites in many industries, increasingly strict legislation and concerns about disposal of composites by landfill or incineration. Part one discusses the management of waste composites and includes an introduction to composites recycling and a chapter on EU legislation for recycling waste composites. Part two reviews thermal technologies for recycling waste composites with chapters on pyrolysis, catalytic transformation, thermal treatments for energy recovery and fluidized bed pyrolysis. Part three covers mechanical methods of recycling waste composites. This section includes chapters on additives for recycled plastic composites, improving mechanical recycling and the quality and durability of mechanically recycled composites. Parts four discusses improving sustainable manufacture of composites, with chapters on environmentally-friendly filament winding of FRP composites, process monitoring and new developments in producing more functional and sustainable composites. Part five gives a review of case studies including end-of-life wind turbine blades, aerospace composites, marine composites, composites in construction and the recycling of concrete. With its distinguished editor and international team of contributors, Management, recycling and reuse of waste composites is a standard reference for anyone involved in the disposal or recycling of waste composites. Reviews the increasingly important issues of recycling and reuse as a result of the increased use of composites Discusses the management of waste composites and EU legislation with regards to recycling Examines methods for recycling, including thermal technologies and mechanical methods*

## Topology Optimization

## Theory, Methods, and Applications

**Springer Science & Business Media** *The topology optimization method solves the basic enginee- ring problem of distributing a limited amount of material in a design space. The first edition of this book has become the standard text on optimal design which is concerned with the optimization of structural topology, shape and material. This edition, has been substantially revised and updated to reflect progress made in modelling and computational procedures. It also encompasses a comprehensive and unified description of the state-of-the-art of the so-called material distribution method, based on the use of mathematical programming and finite elements. Applications treated include not only structures but also materials and MEMS.*