

High Speed Imaging Aostechnologies

Understanding and being able to predict fluvial processes is one of the biggest challenges for hydraulics and environmental engineers, hydrologists and other scientists interested in preserving and restoring the diverse functions of rivers. The interactions among flow, turbulence, vegetation, macroinvertebrates and other organisms, as well as the transport and retention of particulate matter, have important consequences on the ecological health of rivers. Managing rivers in an ecologically friendly way is a major component of sustainable engineering design, maintenance and restoration of ecological habitats. To address these challenges, a major focus of River Flow 2016 was to highlight the latest advances in experimental, computational and theoretical approaches that can be used to deepen our understanding and capacity to predict flow and the associated fluid-driven ecological processes, anthropogenic influences, sediment transport and morphodynamic processes. River Flow 2016 was organized under the auspices of the Committee for Fluvial Hydraulics of the International Association for Hydro-Environment Engineering and Research (IAHR). Since its first edition in 2002, the River Flow conference series has become the main international event focusing on river hydrodynamics, sediment transport, river

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engineering and restoration. Some of the highlights of the 8th International Conference on Fluvial Hydraulics were to focus on inter-disciplinary research involving, among others, ecological and biological aspects relevant to river flows and processes and to emphasize broader themes dealing with river sustainability. River Flow 2016 (extended abstract book 854 pages + full paper CD-ROM 2436 pages) contains the contributions presented during the regular sessions covering the main conference themes and the special sessions focusing on specific hot topics of river flow research, and will be of interest to academics interested in hydraulics, hydrology and environmental engineering.

This book provides in-depth explanations of design theories and methods for remote sensing satellites, as well as their practical applications. There have been significant advances in spacecraft remote sensing technologies over the past decade. As the latest edition of the book "Space Science and Technology Research," it draws on the authors' vast engineering experience in system design for remote sensing satellites and offers a valuable guide for all researchers, engineers and students who are interested in this area. Chiefly focusing on mission requirements analyses and system design, it also highlights a range of system design methods. The goal of this book is to collect methods and

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protocols for studying cilia in a wide range of different cell types, so that researchers from many fields of biology can start exploring the role of cilia in their own system. Chapters are written by experts in the field Cutting-edge material

The authors of this book provide the first review of haptic optical tweezers, a new technique which brings together force feedback teleoperation and optical tweezers. This technique allows users to explore the microworld by sensing and exerting piconewton-scale forces with trapped microspheres. The design of optical tweezers for high-quality haptic feedback is challenging, given the requirements for very high sensitivity and dynamic stability. The concept, design process and specification of optical tweezers reviewed throughout this book focus on those intended for haptic teleoperation. The authors provide two new specific designs as well as the current state of the art. Furthermore, the remaining important issues are identified for further developments. Haptic optical tweezers will soon become an invaluable tool for force feedback micromanipulation of biological samples and nano- and micro-assembly parts.

Global electro-optic technology and markets.

This collection of essays covers topics such as: SATCOM license and frequency and regulatory issues and policy developments for global connectivity; applications for switched bandwidth systems; advanced mobile SATCOM; and intersatellite communications links for high data rates and interoperability.

This extensive collection of papers constitutes an

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invaluable source of information covering the current state of the art with regard to manufacturing science and engineering, and focussing on Advanced Composite Materials. These 534 peer-reviewed papers are grouped into 12 chapters: CAD/CAM; Ceramic-Matrix Composites; Coatings, Damage Mechanics; Design of Materials and Components, Environmental Effects; Metal-Matrix Composites; Modelling; Non-Destructive Evaluation; Polymer-Matrix Composites; Processing and Manufacturing, Properties and Performance; Prototyping Reinforcement Materials, Repair, Testing; Thermoplastic Composites; Nanotechnology.

Big Data and Smart Service Systems presents the theories and applications regarding Big Data and smart service systems, data acquisition, smart cities, business decision-making support, and smart service design. The rapid development of computer and Internet technologies has led the world to the era of Big Data. Big Data technologies are widely used, which has brought unprecedented impacts on traditional industries and lifestyle. More and more governments, business sectors, and institutions begin to realize data is becoming the most valuable asset and its analysis is becoming the core competitiveness. Describes the frontier of service science and motivates a discussion among readers on a multidisciplinary subject areas that explores the design of smart service Illustrates the concepts,

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framework, and application of big data and smart service systems Demonstrates the crucial role of smart service to promote the transformation of the regional and global economy

Volume is indexed by Thomson Reuters CPCI-S (WoS). The present work presents up-to-date contributions to the field of mechanisms, mechanical transmissions, robotics and mechatronics. The topics covered are: kinematics, dynamics, analysis and synthesis, mechanical design, sensors and actuators, intelligent control systems and related applications in planar and spatial mechanisms and mechanical transmissions, biomechanics, serial and parallel robots, mobile robots, tele-operation, haptics, virtual reality and precision mechanics. The results reported here should be of interest to researchers, scientists, industrial experts, teachers and students in the fields of engineering as related to design, control and applications.

Volume is indexed by Thomson Reuters CPCI-S (WoS). These proceedings comprise fully-refereed papers presented at the conference. The main conference theme was Mechanical and Aerospace Engineering, and the main goal of the event was to provide an international scientific forum for the exchange of new ideas in a number of fields and for in-depth discussions with peers from around the world. Core areas of mechanical and aerospace engineering are covered, together with

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multidisciplinary, interdisciplinary research and applications; thus making the work an excellent guide to those topics.

Sections 1-2. Keyword Index.--Section 3. Personal author index.--Section 4. Corporate author index.--Section 5. Contract/grant number index, NTIS order/report number index 1-E.--Section 6. NTIS order/report number index F-Z.

Directory of leading scientists and engineers who are the leaders in the most important areas of American technology. Each entry gives education, publications, achievements, area of expertise, honors, patents, and personal information.

The Magnesium Technology Symposium, which takes place every year at the TMS Annual Meeting & Exhibition, is one of the largest yearly gatherings of magnesium specialists in the world. Papers are presented in all aspects of the field, ranging from primary production to applications to recycling.

Moreover, papers explore everything from basic research findings to industrialization. Magnesium Technology 2011 covers a broad spectrum of current topics, including alloys and their properties; cast products and processing; wrought products and processing; forming, joining, and machining; corrosion and surface finishing; ecology; and structural applications. In addition, you'll find coverage of new and emerging applications in such areas as biomedicine and hydrogen storage.

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While lecturing in recent months at a number of prominent institutions, I asked some of the residents and fellows whether and how they might benefit from a book on corneal biomechanics. The typical response was the look of a deer caught in the headlights as they tried to intuit the “appropriate” answer, but had little understanding or insight as to why this would be an important and useful knowledge base for them now, or in the future. I then posed the question differently. “Would a book that explained corneal biomechanical principles and testing devices and their application in detecting eyes at risk for developing keratoconus and post-LASIK ectasia, understanding the biomechanical impact of specific types of keratorefractive surgery and riboflavin UV-A corneal collagen cross-linking, and the impact of corneal biomechanics on the fidelity of intraocular pressure measurement and risk for glaucoma progression be of interest?” Framed in this context, the answer I got was a resounding, “Yes!” Therein lies a fundamental disconnect that highlights both the opportunity and need to educate all ophthalmologists about this nascent field. This comprehensive book is strengthened by the breadth of contributions from leading experts around the world and provides an important resource for ophthalmologists at all levels of training and experience. It gives a panoramic snapshot of our understanding of corneal biomechanics today,

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bridging the gap between theoretical principles, testing devices that are commercially available and in development as well as current and potential future clinical applications. While there has been a long-held appreciation that all types of keratorefractive surgery have an impact and interdependence on corneal biomechanics and wound healing, the initial finite element analyses that were applied to understand radial keratotomy were limited by incorrect assumptions that the cornea was a linear, elastic, homogenous, isotropic material.¹ With the advent of excimer laser vision correction, critical observations indicated that Munnerlyn's theoretic ablation profiles did not account for either lower or higher order (e.g. spherical aberration) refractive outcomes,² suggesting that there were important components missing from the equation—e.g., corneal biomechanics and wound healing. In a seminal editorial, Roberts³ pointed out that the cornea is not a piece of plastic, but rather a material with viscoelastic qualities. Since that time, much has been learned about spatial and depth-related patterns of collagen orientation and interweaving, as well as the biomechanical response to different keratorefractive surgeries that sever tension-bearing lamellae, as the cornea responds to and redistributes stress induced by IOP, hydration, eye rubbing, blinking and extraocular muscle forces.³⁻⁶ The first reports of post-LASIK ectasia⁷

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highlighted the need to identify a biomechanical signature of early keratoconus as well as corneas at high risk of developing ectasia irrespective of their current topography or tomography. The introduction of two instruments into clinical use—the Ocular Response Analyzer (ORA) and the Corneal Visualization Scheimpflug Technology (Corvis ST)—that allow measurement of various biomechanical metrics further catapulted the field. The availability of these instruments in routine clinical settings allowed the systematic study of the effect of age, collagen disorders, collagen cross-linking, corneal rings, flaps of various depths, contour, sidecut angulation, pockets, and flockets, just to name a few. Future application of biomechanics to the sclera may improve our understanding of the development and prevention of myopia, as well as scleral surgeries and treatments under development for presbyopia. It was appreciated by Goldmann and Schmidt that corneal thickness and curvature would influence the measurement of applanation tonometry. The recent ability to measure some corneal biomechanical metrics have led to IOP measurement that may be more immune both to their influence and the impact of central corneal thickness (CCT). Certain chapters in this book explain how a thin cornea could be stiffer than a thick one and that stiffness is also impacted by IOP, thereby precluding simplistic attempts to

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adjust IOP measurements using nomograms based upon CCT alone. Also highlighted is how corneal hysteresis, the ability of the cornea to absorb and dissipate energy during the bidirectional applanation response to a linear Gaussian air puff, appears to be an independent risk factor for glaucoma progression and rate of progression.^{9,10} This comprehensive book starts out with a section devoted to outlining basic biomechanical principles and theories, teaching us the language of what Dupps¹¹ has referred to as “mechanospeak”, thus providing a context and common vocabulary to better comprehend the following chapters. By first defining basic concepts such as stress-strain relationships and creep, this theoretical basis is later applied to explain the pathogenesis of corneal diseases, e.g., explaining how a focal abnormality in corneal biomechanical properties precipitates a cycle of decompensation and localized thinning and steepening, clinically expressed as ectasia progression. These early chapters further detail biomechanical differences between in-vivo and ex-vivo testing, between human and animal corneas and sclera, and between methods of testing. The second section provides a thorough description of two FDA-approved devices to measure corneal biomechanics in the clinic (i.e., the ORA and the Corvis ST), as well as an overview of potential future technologies, including OCT with air puff stimulus,

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ocular pulse elastography, and Brillouin microscopy. The third and final section of the book is a thorough treatise on how to interpret the metrics derived from the waveform provided by available clinical devices; their adjunct use in ectasia risk screening; the comparative biomechanical impact of various keratorefractive surgeries and corneal procedures such as PRK, LASIK, SMILE, and corneal collagen cross-linking; the impact of corneal biomechanics on IOP measurement; and potential biomechanical markers of enhanced susceptibility to glaucoma progression. This compendium of our current knowledge of corneal biomechanics, its measurement and application, provides a strong foundation to more fully understand advances in keratorefractive and corneal surgery, diseases, and treatments, all of which are interdependent on and influence inherent corneal biomechanical properties and behavior. Both the robust aspects and limitations of our current understanding are presented, including the challenge of creating accurate and predictive finite element models that incorporate the impact of IOP, corneal thickness, geometry, and scleral properties on corneal biomechanics. This book provides a key allowing clinical ophthalmologists and researchers to grasp the basics and nuances of this exciting field and to shape it as it evolves in the future.

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