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Developments in Mechanics of Structures and Materials  
 Explosion Systems with Inert High-Modulus Components  
 Fire, Static and Dynamic Tests of Building Structures  
 Dynamic Behavior of Soft and Hard Materials, Volume 2  
 Tunnels and Underground Structures: Proceedings Tunnels & Underground Structures, Singapore 2000  
 Ballistics 2011  
 IUTAM Symposium on Theoretical, Computational and Modelling Aspects of Inelastic Media  
 The Science of Armour Materials  
 Dynamic Behavior of Materials, Volume 1  
 NASA Conference Publication  
 Advanced and Emerging Polybenzoxazine Science and Technology  
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 Urban Habitat Constructions Under Catastrophic Events  
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 Behavior of Materials under Impact, Explosion, High Pressures and Dynamic Strain Rates  
 Computer Technology for Textiles and Apparel  
 BALLISTICS 2014  
 Ceramic Armor and Armor Systems II  
 Composite Solutions for Ballistics  
 Image and Graphics Technologies and Applications  
 Rock Fragmentation by Blasting  
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 Damaging Effects of Weapons and Ammunition  
 2021 International Conference on Development and Application of Carbon Nanomaterials in Energetic Materials  
 Structures Under Shock and Impact XI  
 Civil, Architecture and Environmental Engineering  
 Multi-layer Pavement System under Blast Load  
 Rock Fragmentation by Blasting  
 Hyper-Velocity Impacts on Rubble Pile Asteroids  
 Biomechanical Modelling and Simulation on Musculoskeletal System  
 Advances in Protective Structures Research

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## SANAA BEARD

**Developments in Mechanics of Structures and Materials** Springer Science & Business Media  
 Original research from around the world on weapons-grade projectiles, warheads, missiles, guns and their effects on target materials  
 New information on shaped charges, fire, control strategies, simulation, blast resistance, non-lethal systems and more  
 190 original presentations in two printed volumes, plus searchable CD  
 The first part of this 2-volume set, part of an ongoing series, presents previously unpublished research on the design and modeling of ballistic devices ranging from shells to missiles, including explosives, propellants and internal components. The second part investigates the effects of ballistic penetrants on a variety of targets, including human models, as well as hard targets and diverse armors made from engineered fibers, ceramics, metal alloys and concrete. Data is included on the modeling and testing of novel devices, explosives and shielding strategies. Papers in this text were presented at a symposium organized by the National Defense Industrial Association with the International Ballistics Society. The CD-ROM displays figures and illustrations in articles in full color along with a title screen and main menu screen. Each user can link to all papers from the Table of Contents and Author Index and also link to papers and front matter by using the global bookmarks which allow navigation of the entire CD-ROM from every article. Search features on the CD-ROM can be by full text including all key words, article title, author name, and session title. The CD-ROM has Autorun feature for Windows 2000 with Service Pack 4 or higher products along with the program for Adobe Acrobat Reader with Search 11.0. One year of technical support is included with your purchase of this product.

**Explosion Systems with Inert High-Modulus Components** Taylor & Francis Group  
 This book proposes the concept of a multi-layer pavement system to fulfill the blast resistance requirement for pavement design. It also presents a damage pattern chart for multi-layer pavement design and rapid repair after blast load. Such a multi-layer system consists of three layers including asphalt concrete (AC) reinforced with Geogrid (GST) at the top, a high-strength concrete (HSC) layer in the middle, and engineered cementitious composites (ECC) at the bottom. A series of large-scale laboratory impact tests were carried out to prove the usefulness of this concept and show its advantages over other conventional pavement system. Furthermore, field blast tests were conducted to show the actual behavior of this multi-layer pavement system subjected to blast load under real-world conditions.

*Fire, Static and Dynamic Tests of Building Structures* WIT Press  
 This two-volume work contains the papers presented at the 2016 International Conference on Civil, Architecture and Environmental Engineering (ICCAE 2016) that was held on 4-6 November 2016 in Taipei, Taiwan. The meeting was organized by China University of Technology and Taiwan Society of Construction Engineers and brought together professors, researchers, scholars and industrial pioneers from all over the world. ICCAE 2016 is an important forum for the presentation of new research developments, exchange of ideas and experience and covers the following subject areas: Structural Science & Architecture Engineering, Building Materials & Materials Science, Construction Equipment & Mechanical Science, Environmental Science & Environmental Engineering, Computer Simulation & Computer and Electrical Engineering.

**Dynamic Behavior of Soft and Hard Materials, Volume 2** Springer Science & Business Media  
 Dynamics of multibody systems is of great importance in the fields of robotics, biomechanics, spacecraft control, road and rail vehicle design, and dynamics of machinery. Many research problems have been solved and a considerable number of computer codes based on multibody formalisms is now available. With the present book it is intended to collect software systems for multibody system dynamics which are well established and have found acceptance in the users

community. The Handbook will aid the reader in selecting the software system which is most appropriate to his needs. Altogether 17 research groups contributed to the Handbook. A compact summary of important capabilities of these software systems is presented in tabular form. All authors dealt with two typical test examples, a planar mechanism and a spatial robot. Thus, it is very easy to compare the results and to identify more clearly the advantages of one or the other formalism.

*Tunnels and Underground Structures: Proceedings Tunnels & Underground Structures, Singapore 2000* Springer Nature

Comprehensive coverage of weapon damage effects on a variety of objects  
 Damaging Effects of Weapons and Ammunition delivers a thorough exploration of a range of issues related to the effects of ammunition and weapons. The book includes coverage of the basic concepts of the theory of efficiency and the physical foundations of the functional and damaging effects of fragments, shaped charges, high-explosive and penetrating weapons. The author discusses the calculation formulas used to evaluate the parameters of damage fields and their interaction with various objects. Additionally, the book expands on the damage criteria of weapons, the characteristics of the vulnerability of objects with respect to a variety of damaging factors, dependencies for assessing safe distances, and the resistance of various structures to the effects of explosion and impact. Damaging Effects of Weapons and Ammunition also offers: Detailed calculation methods indicating areas of application and the necessary units of used quantities  
 Extensive examples of classic designs of ammunition from around the world  
 Discussions of the characterization of various types of ammunition, including high-explosive, fragment, penetrative, and shaped charges  
 A chapter on the numerical simulation of high-speed processes  
 Perfect for technical specialists working in the fields of explosion safety and explosives, Damaging Effects of Weapons and Ammunition also belongs in the libraries of researchers and students studying explosion phenomena, explosive technologies, explosion safety, and materials science.

*Ballistics 2011* DESTech Publications, Inc  
 Organised by University of Rome 'La Sapienza', Italy, Wessex Institute of Technology, UK.  
*IUTAM Symposium on Theoretical, Computational and Modelling Aspects of Inelastic Media* Springer  
 The thesis presents a tool to create rubble pile asteroid simulants for use in numerical impact experiments, and provides evidence that the asteroid disruption threshold and the resultant fragment size distribution are sensitive to the distribution of internal voids. This thesis represents an important step towards a deeper understanding of fragmentation processes in the asteroid belt, and provides a tool to infer the interior structure of rubble pile asteroids. Most small asteroids are 'rubble piles' - re-accumulated fragments of debris from earlier disruptive collisions. The study of fragmentation processes for rubble pile asteroids plays an essential part in understanding their collisional evolution. An important unanswered question is "what is the distribution of void space inside rubble pile asteroids?" As a result from this thesis, numerical impact experiments can now be used to link surface features to the internal structure and therefore help to answer this question. Applying this model to asteroid Šteins, which was imaged from close range by the Rosetta spacecraft, a large hill-like structure is shown to be most likely primordial, while a catena of pits can be interpreted as evidence for the existence of fracturing of pre-existing internal voids.

*The Science of Armour Materials* Springer Nature  
 This text examines the interaction between blast pressure and surface or underground structures, whether the blast is from civilian, military, dust and natural explosions, or any other source.  
*Dynamic Behavior of Materials, Volume 1* CRC Press  
 Computer technology has transformed textiles from their design through to their manufacture and has contributed to significant advances in the textile industry. Computer technology for textiles and apparel provides an overview of these innovative developments for a wide range of applications,

covering topics including structure and defect analysis, modelling and simulation, and apparel design. The book is divided into three parts. Part one provides a review of different computer-based technologies suitable for textile materials, and includes chapters on computer technology for yarn and fabric structure analysis, defect analysis and measurement. Chapters in part two discuss modelling and simulation principles of fibres, yarns, textiles and garments, while part three concludes with a review of computer-based technologies specific to apparel and apparel design, with themes ranging from 3D body scanning to the teaching of computer-aided design to fashion students. With its distinguished editor and international team of expert contributors, Computer technology for textiles and apparel is an invaluable tool for a wide range of people involved in the textile industry, from designers and manufacturers to fibre scientists and quality inspectors. Provides an overview of innovative developments in computer technology for a wide range of applications Covers structure and defect analysis, modelling and simulation and apparel design Themes range from 3D body scanning to the teaching of computer-aided design to fashion students [NASA Conference Publication](#) CRC Press

This book includes examinations of the role of full-scale buildings in the development of structural design methods and recommendations on improved construction practice and safety of building occupants in the event of fire and explosion.

*Advanced and Emerging Polybenzoxazine Science and Technology* DEStech Publications, Inc  
This book, written for the benefit of engineering students and practicing engineers alike, is the culmination of the author's four decades of experience related to the subject of electrical measurements, comprising nearly 30 years of experimental research and more than 15 years of teaching at several engineering institutions. The unique feature of this book, apart from covering the syllabi of various universities, is the style of presentation of all important aspects and features of electrical measurements, with neatly and clearly drawn figures, diagrams and colour and b/w photos that illustrate details of instruments among other things, making the text easy to follow and comprehend. Enhancing the chapters are interspersed explanatory comments and, where necessary, footnotes to help better understanding of the chapter contents. Also, each chapter begins with a "recall" to link the subject matter with the related science or phenomenon and fundamental background. The first few chapters of the book comprise "Units, Dimensions and Standards"; "Electricity, Magnetism and Electromagnetism" and "Network Analysis". These topics form the basics of electrical measurements and provide a better understanding of the main topics discussed in later chapters. The last two chapters represent valuable assets of the book, and relate to (a) "Magnetic Measurements", describing many unique features not easily available elsewhere, a good study of which is essential for the design and development of most electric equipment - from motors to transformers and alternators, and (b) "Measurement of Non-electrical Quantities", dealing extensively with the measuring techniques of a number of variables that constitute an important requirement of engineering measurement practices. The book is supplemented by ten appendices covering various aspects dealing with the art and science of electrical measurement and of relevance to some of the topics in main chapters. Other useful features of the book include an elaborate chapter-by-chapter list of symbols, worked examples, exercises and quiz questions at the end of each chapter, and extensive authors' and subject index. This book will be of interest to all students taking courses in electrical measurements as a part of a B.Tech. in electrical engineering. Professionals in the field of electrical engineering will also find the book of use.

*Civil, Architecture and Environmental Engineering Volume 1* CRC Press

This work comprises papers based on some of the talks presented at the IUTAM Symposium of the same name, held in Cape Town, January 14-18, 2008. This volume treats cutting-edge issues in modelling, the behaviour of various classes of inelastic media, and associated algorithms for carrying out computational simulations. A key feature of the contributions are works directed at modelling behaviour at the meso and micro-scales, and at bridging the micro-macro scales.

*Urban Habitat Constructions Under Catastrophic Events* John Wiley & Sons

Describes in one volume the data received during experiments on detonation in high explosive charges This book brings together, in one volume, information normally covered in a series of journal articles on high explosive detonation tests, so that developers can create new explosive technologies. It focuses on the charges that contain inert elements made of materials in which a sound velocity is significantly higher than a detonation velocity. It also summarizes the results of experimental, numerical, and theoretical investigations of explosion systems, which contain high modulus ceramic components. The phenomena occurring in such systems are described in detail: desensitization of high explosives, nonstationary detonation processes, energy focusing, and Mach stems formation. Formation of hypersonic flows of ceramic particles arising due to explosive collapse of ceramic tubes is another example of the issues discussed. Explosion Systems with Inert High Modulus Components: Increasing the Efficiency of Blast Technologies and Their Applications also looks at the design of explosion protective structures based on high modulus ceramic materials. The structural transformations, caused in metallic materials by the energy focusing, or by the impact of hypersonic ceramic jets are also discussed. These transformations include, but not limited to adiabatic shear banding, phase transformations, mechanical twinning, melting, boiling, and even evaporation of the impacted substrates. Specifically discusses in one volume the explosions involved with inert high modulus components normally scattered over numerous journal articles Covers methods to increase energy output of a weak explosive by encasing it in a higher explosive Discusses the specifics of explosive systems containing high modulus inert elements Details the process of detonation and related phenomena, as well as the design of novel highly performant explosive systems Describes the transformation in materials impacted due to explosion in such systems Explosion Systems with Inert High Modulus Components will be of great interest to specialists working in fields of energy of the explosion and explosion safety as well as university staff, students, and postgraduate students studying explosion phenomena, explosive technologies, explosion safety, and materials science.

*Numerical Simulations of Physical and Engineering Processes* Springer

The increasing need to protect civilian infrastructure and industrial facilities against unintentional loads arising from accidental impact and explosion events as well as terrorist attacks is of major

importance. While advances have been made in recent years, many challenges remain, such as to develop more effective and efficient blast and impact mitigation approaches than those that currently exist. The primary focus remains the survivability of physical facilities and the protection of people, as well as reducing economic losses and impact on the environment, with emphasis on innovative protective technologies to support the needs of an economically growing, modern society. The application of this technology ranges from the safe transportation of people and dangerous materials to defences against natural hazards such as floods, wind, storms, tsunamis and earthquakes. Large scale testing is prohibitive and small scale laboratory testing results in scaling uncertainties. Continuing research is therefore essential to improve knowledge on how these structures behave under a variety of load actions, some of which interact making it even more complex and difficult to define. Consequently, more use of advanced numerical simulations for load and structural response calculations is common practice in industry and research. Such calculations can directly be used in design and risk assessment calculations, but also be applied to more simplified design tools and design codes. Whether numerical or analytical modelling techniques are employed, experimental validation is vital for there to be acceptance of the approach to be used. The included papers, presented at the 16th International Conference on Structures under Shock and Impact, highlight new research ideas and results to promote a better understanding of the critical issues relating to the testing behaviour, modelling and analyses of protective structures against blast and impact loading.

*LDEF* CRC Press

This text describes topics discussed at the conference, including: tunnelling and construction in soft ground and rocks; geological investigations; tunnelling machines; planning for underground infrastructure; safety issues and environmental and social aspects of underground development.

*Projectile Impact* John Wiley & Sons

Advanced and Emerging Polybenzoxazine Science and Technology introduces advanced topics of benzoxazine resins and polybenzoxazines as presented through the collaboration of leading experts in the benzoxazine community, representing the authoritative introduction to the subjects. Broad topics covered include the recent development and improved understanding of the subjects, including low temperature cure, aerogels and carbon aerogels, smart chemistry in fire retarding materials and coatings, metal containing benzoxazines, rational design of advanced properties, and materials from natural renew. In the past twenty years, the number of papers on polybenzoxazine has continuously increased at an exponential rate. During the past three years, the number of papers published is more than the previous 17 years combined. The material is now part of only a few successfully commercialized polymers in the past 35 years. Therefore, interest in this material in both academia and industry is very strong. Includes the latest advancements in benzoxazine chemistry Describes advanced materials, such as aerogels, carbons, smart coatings, nanofibers, and shape memory materials Includes additional characterization data and techniques, such as FT-IR, Raman, NMR, DSC, and TGA analyses

*Computational Plasticity* CRC Press

The International Association of Protective Structures (IAPS) was launched on 1 October 2010 in Manchester, UK during the first International Conference of Protective Structures. The primary purpose of IAPS is to bring researchers and engineers working in the area of protective structures together, and to promote research and development work for better life and structure protection against shock and impact loads. More information can be found at <http://www.protectivestructures.org/contact.html>. Advances in Protective Structures Research is the first publication in a series of planned publications by IAPS. It contains 13 chapters prepared by active and prominent researchers around the world in the area of protective structures. It covers the dynamic material model and material properties, structural response analysis, structural reliability analysis, impact loads and ground shock. The contents of the book reflect well the current research achievements and practice in structural protection against blast and impact loads. They represent the advanced international research status in theoretical derivations, numerical simulations, and laboratory and field tests for structure protections.

*Design Against Blast* BoD - Books on Demand

COST is an intergovernmental framework for European Cooperation in Science and Technology, allowing the coordination of nationally-funded research on a European level. Part of COST was COST Action C26Urban Habitat Constructions Under Catastrophic Events which started in 2006 and held its final conference in Naples, Italy, on 16-18 September 201

*Structures Under Shock and Impact XVI* Springer

High energy impact phenomena have been investigated by engineers of various backgrounds and disciplines. Structures often need to be designed against impact or potential attack and on the other hand the removal of decommissioned structures may be achieved by shaped charge impact, alternatively known as explosive cutting. The topic of ballistic impact is wide-ranging and encompasses various levels of kinetic energy input as well as a multitude of projectile-target materials and geometries. It has thus become the object of many experimental and analytical investigations resulting in numerous sparsely-spread articles in periodicals and conference proceedings as well as monographs narrowly focusing on specific types and ranges of impact scenarios. This volume describes a broad spectrum of analytical and experimental work in this area, thus providing considerable insight into the complexity and diversity of impact phenomena. By addressing a significant number of important issues it combines, rather uniquely, subject breadth and density with in-depth study of impact events of great engineering interest.

*Multibody Systems Handbook* WIT Press

This book features selected papers presented at the 2021 International Conference on Development and Application of Carbon Nanomaterials in Energetic Materials. It discusses the latest progress in the field of advance carbon nanomaterials in energetic materials; including the structural design, theoretical calculation, synthesis, properties, and applications of carbon materials. It also presents the new technology and applications of advanced carbon nanomaterials in energetic materials. It can be used as a reference book for researchers in energetic materials and related fields. It is also useful for undergraduates and postgraduates studying these topics.