

# Materials Science

Solid State Physics & Engineering

2004/II

## Nanodiffusion

Diffusion in Nanostructured Materials

Ed. D.L. Beke  
Debrecen University, Hungary  
Journal of Metastable and  
Nanocrystalline Materials Vol. 19



New

This book offers a contemporary overview of nanodiffusion, and details the present state of this rapidly growing field. New conceptions of basic aspects of the diffusion processes occurring at the nanoscale are treated, and many useful insights and results concerning diffusion kinetics in various types of technologically important nanomaterials are presented. The latter include: nanomagnetic materials, consisting of a mixture of magnetic nanoparticles in a residual amorphous magnetic matrix; thin films, bi-layers and multilayers for X-ray or neutron mirrors and for magneto-electronic applications such as GMR; and semiconductor nanosystems for many current and future applications.

ISBN 0-87849-494-4  
190 pages, paperback, 2004, **US\$98.00/€98.00**

## Superplasticity in Advanced Materials

Ed. Richard Todd  
University of Oxford, UK  
Materials Science Forum Vols. 447-448



New

Superplastic forming (SPF) has come a long way from its relatively recent history of being of interest only to the aerospace and aeronautical industries, and has made rapid inroads into applications in the automotive, rail, architectural, sports, dental and entertainment sectors.

This book comprises 82 papers which describe in detail the latest developments in the field. All aspects of the subject are covered, ranging from the atomistic simulation of grain-boundary sliding to the industrial-scale application of superplasticity and of diffusion bonding.

This volume therefore represents an invaluable guide to the state-of-the-art in this field.

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## Progress in Advanced Materials and Processes

Eds. Dragan P. Uskokovic, Slobodan K. Milonjic, Dejan I. Rakovic  
Materials Science Forum Vols. 453-454

Materials science and engineering involve the acquisition of knowledge concerning the synthesis and processing of materials, their composition and structure, properties and behaviour, characteristics and potential, and their application in devices, machines, consumer units and other finished products. Our economic prosperity, quality of life and hopes for a healthy environment are closely connected with improvements in existing products and the development of new ones together with their associated processing technologies.

The ninety-three papers selected by the editors for inclusion in this volume are presented thematically in nine sections: I Thin Films and Nanostructures; II Solid State Phenomena; III Advanced Materials; IV Nanomaterials; V Spectroscopic Characterization; VI Synthesis and Processing; VII Powders and Ceramics; VIII Composites and IX Biomaterials.

Researchers and students will find that this book provides an excellent overview of contemporary progress in this most fascinating of technological fields.

0-87849-940-7, paperback,  
**600 pages, 2004, US\$198.00/€198.00**



## Self-Formation Theory and Applications

Ed. Stepas Janušonis  
Solid State Phenomena Vols. 97-98

This volume comprises the proceedings of the 6th international conference on Self-Formation Theory and Applications.

Six major subject areas were discussed:

i) self-formation, self-assembling of the artificial systems; ii) simulation of self-formation; iii) evolution with increasing complexity; iv) self-formation physics; v) self-formation technology (photovoltaics, fuel cells); vi) self-formation applications in micro-relectronics, nanotechnology, and molecular electronics.

The volume contains 40 selected reports, plus a set of note, lectures which were grouped into 5 sections: self-formation in general, photovoltaics, fuel cells, nanotechnology, and lectures for students.

3-908450-85-3, paperback,  
**510 pages, 2004, US\$178.00/€178.00**



## European Powder Diffraction EPDIC 8

Eds. Yvonne Andersson, Eric J. Mittemeijer, Udo Welzel  
Materials Science Forum Vols. 443-444

X-ray powder diffraction is a long-established and invaluable technique which is widely applied to the characterization of crystalline materials. The method has traditionally been used for phase identification, quantitative analysis and for the determination of structural imperfections. In recent years however, its use has been extended into exciting new areas such as the extraction of three-dimensional microstructural properties.

This book contains 88 papers which deal with new findings, and insights into the subject. The contents are discussed under the headings of METHOD DEVELOPMENT: Determination of Crystal Structure and Lattice Constants, Qualitative and Quantitative Phase Analysis, Analysis of Microstructure and Macrostress, Texture and Coarse Grains; INSTRUMENTAL DEVELOPMENT AND MEASUREMENT TECHNIQUES; NEUTRON POWDER DIFFRACTION; MATERIALS: Thin Layers, Polymers and Amorphous Materials, Metals and Alloys, Minerals and Inorganics, Organic Materials.

Altogether, this timely collection of papers provides an essential outline of the newest developments in the field of Powder Diffraction.

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## Advances in Abrasive Technology VI

Eds. T. Pearce, Y. Gao et al.  
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Eds. H.A. Calderón-Benavides and G. Cabañas-Moreno  
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Eds. K. Uematsu and H. Yokokawa  
Key Engineering Materials Vol. 253  
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Ed. D. Fisher  
Def. and Diffusion Forum Vols. 224-225  
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Ed. D. Fisher  
Def. and Diffusion Forum Vols. 221-223  
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Materials Science Forum Vol. 439  
0-87849-923-7, 2003, 378 pages,  
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Eds. H. Richter and M. Kittler  
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Ed. Xipeng Xu  
Key Engineering Materials Vol. 250  
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## THERMEC'2003

Eds. T. Chandra, Jose M. Torralba et al.  
Materials Science Forum Vols. 426-232  
0-87849-919-9, 2003, 4650 pages,  
**US\$546.00/€546.00**

Descriptions and Full Table of Contents of Each Title at <http://www.ttp.net>

## Advances in Grinding and Abrasive Processes

Ed. Xipeng Xu  
Key Engineering Materials Vols. 259-260

This collection presents a selection of over 250 papers, submitted to the conference by many universities and industrial concerns. All of the papers were subjected to peer-review by at least two expert referees. Moreover, fifteen papers on high-speed machining were specially selected by Dr. Ning He, a full professor at Nanjing University of Aeronautics and Astronautics (NUAA), from papers submitted to the International Conference on High Speed Machining, which is organized by the NUAA and will be held in Nanjing from March 31st to April 2nd, 2004. These papers have been selected for the present volume because of their quality and the fact that they cover the main topics of the conference.

Overall, the volume presents the reader with recent advances in the field of abrasive technology. It is divided into five sections: (i) Tooling technology; (ii) Processes and mechanisms; (iii) Novel techniques; (iv) Automation and (v) High-speed machining.

The topics covered include the mechanics and control of grinding and abrasive processes, the modeling and simulation of grinding and cutting processes, high-speed machining, micro-machining, measurement and surface quality assessment, cooling and coolants, polishing, wheel truing and dressing, novel abrasive techniques and novel machining techniques. The book will therefore be of great interest to production and research engineers, research students and academics working in this field.

0-87849-934-2, paperback,  
**902 pages, 2004, US\$268.00/€268.00**



New

## Designing, Processing and Properties of Advanced Engineering Materials

Eds. S.-G. Kang and T. Kobayashi  
Materials Science Forum Vols. 449-452

This two volumes set covers the following topics: I. Design of Advanced Engineering Materials. II. Processing of Advanced Engineering Materials. III. Properties of Advanced Engineering Materials. IV. Development of Functional Materials.

The few highlights include: High Performance Materials Development in the 21st Century: Trends and Directions, J.C. Williams. Processing and Alloy Development to Optimise the Properties and Cost-Effectiveness of Components Manufactured from TiAl-Based Alloys, X. Wu, D. Hu and M.H. Loretto. Orientation Dependence of Dynamic Recrystallization Behavior of Al Single Crystals, Y. Miura and K. Ihara. Aerosol Deposition Method for Fabrication of Nano Crystal Ceramic Layer, J. Akedo.

0-87849-939-3, paperback,  
**1378 pages, 2 vols. set, 2004, US\$319.00/€319.00**

## Advances in Fracture and Failure Prevention

Eds. Kikuo Kishimoto, Masanori Kikuchi,  
Tetsuo Shoji and Masumi Saka  
Key Engineering Materials Vols. 261-263

This 2-volumes set presents the latest findings and ideas of engineers and scientists involved in studying the fracture and strength of solids all around the world. The two-volume set features 271 peer-reviewed papers from scientists and engineers coming from 30 different countries. These include the papers arising from plenary lectures and keynote lectures which gave a broad overview of the state-of-the-art of fracture research and failure prevention. It is strongly hoped that the new ideas and results presented in this set will stimulate and enhance progress in fracture mechanics research and in the fundamental understanding of fracture and failure prevention in structures.

The set is divided into the following sections: Invited Lecture; Fracture and Fracture Mechanics; Dynamic Behavior of Solids; Interfacial Problems; Electrical Devices and Systems; Computational Analyses and Fracture Simulations; Optimization; Invited and Keynote Lecture; Physics & Chemistry of Fracture and Failure Prevention; Fatigue and Creep; Corrosion and Damage Evaluation; Composite Materials; Measurement Methods.

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**1754 pages, 2-vols. set, 2004, US\$388.00/€388.00**

## Bioceramics 16

Eds. Mário A. Barbosa, Fernando J.  
Monteiro, Rui Correia, Betty Leon  
Key Engineering Materials Vols. 254-256

Since their inception, the Bioceramics meetings have provided a treasure-house of invaluable information for both scientists and clinicians in the medical field.

This volume of the Bioceramics series is a collection of papers accepted for the 16th International Symposium on Ceramics in Medicine, held in Porto, Portugal, from the 6th to the 9th of November, 2003. The topics covered by the papers include: Bioactive ceramics, Glass ceramics, Apatites, Coating technologies (chemical and physical), Thin films, Nanotechnology as applied to bioceramics, Hybrids and composites, Zirconia and alumina bioceramics, Bi-material interfaces, Porous bioceramics, Bone cements, Tissue engineering scaffolds (for bone and cartilage repair), Artificial bone grafts, Mechanical properties, Bearing surfaces, Release of biologically active molecules, Injectable materials for bone regeneration, Surface properties vs. biological behaviour, Cell response to ceramics, Platelet adhesion to metal oxides, Antibacterial surfaces and materials, Dental applications, Orthopaedic applications and Animal studies.

This book will prove to be an essential reference work for biomedical engineers, biologists, clinicians and scientists.

0-87849-932-6, hardcover,  
**1166 pages, 2004, US\$315.00/€315.00**



New

## Positron Annihilation

Eds. Toshio Hyodo, Yoshinori Kobayashi,  
Yasuyuki Nagashima, Haruo Saito  
Materials Science Forum Vols. 445-446

There is no doubt that, when it comes to the study of the structures and defects of materials, there is presently no technique that rivals positron annihilation. The increasing demands for higher accuracy and reliability provide a constant stimulus to the field, and the present work presents the newest and most important scientific discoveries made in the field of positron annihilation.

Many important new results concerning positron and positronium studies of nano-materials, defects, porous materials, low-k dielectrics, polymers, liquids, atomic physics and new instrumentation are reported in the present contributions; presented by experts from all over the world.

There can be no better way of keeping up with this rapidly advancing field.

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Eds. Xipeng Xu, Jianyun Shen and Yuan Li  
Key Engineering Materials Vols. 202-203  
0-87849-878-8, 2001, 512 pages,  
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### Advances in Engineering Plasticity

Eds. T.X. Yu, Q.P. Sun and J.K. Kim  
Key Engineering Materials Vols. 177-180  
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Materials Science Forum Vol. 377  
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### European Powder Diffraction

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Eds. W. Triftshäuser, G. Kögel and P. Sperr  
Materials Science Forum Vols. 363-365  
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