

# Materials Science

Solid State Physics & Engineering

2005/I

## Explosion, Shock Wave and Hypervelocity Phenomena in Materials

Eds. S. Itoh, K. Hokamoto and M. Fujita  
Materials Science Forum Vols. 465-466

Recent years have witnessed an astonishing growth in research on materials science. Exotic new materials, innovative processing techniques and challenging computational methods make the pursuit of research in this field increasingly interesting and rewarding. Considering as it does, the significance of shock-wave phenomena in the rapidly changing materials science scene, this collection of papers will undoubtedly foster further advanced research into the allied research areas of explosive, shock-wave and hypervelocity phenomena in materials.

The collection comprises 76 papers, and the topics covered include various high-velocity phenomena in materials; such as dynamic deformation and fracture, dynamic processing of materials, and detonation and shock waves.

ISBN 0-87849-950-4  
490 pages, paperback, 2004, **US\$228.00/€198.00**



## Recrystallization and Grain Growth

Eds. B. Bacroix, J.H. Driver, R. Le Gall, Cl. Maurice, R. Penelle, H. Réglé and L. Tabourot

Materials Science Forum Vols.467-470

Recrystallization and grain growth, together with phase transformations such as precipitation, are the fundamental processes of microstructural evolution which take place during the thermomechanical processing of engineering materials. They are of major scientific interest and are of great importance in a wide range of industrial applications.

One of the main goals of this two-volume set is to show how to cover the entire set of reactions governing recrystallization and grain growth during industrial processing – termed through process modelling.

The reader will be able to find within these two volumes a wealth of up-to-date papers describing current issues, concepts, techniques and results which will, in turn, improve his understanding of recrystallization and grain growth.

ISBN 0-87849-952-0  
1472 pages, 2-vols. set, paperback, 2004,  
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Eds. M. Gupta and Christina Y.H. Lim

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Eds. W.P. Shen and J.Q. Xu  
Key Engineering Materials Vols. 274-276

These proceedings comprise the 192 papers which were presented at the Seventh Asia-Pacific Symposium on Engineering Plasticity and Its applications (AEPA2004), held on the 22nd to 26th September 2004 at Shanghai Jiaotong University, P.R.China.

The two-volume set covers a wide range of topics including damage and failure, constitutive modeling, rate-dependent and time-dependent behaviors, micromechanics, fatigue evaluation, numerical and analytical techniques, experimental techniques, advanced materials, forming, machining, superplasticity and structural stability. The latest advances achieved, in these areas, by participants from more than 20 countries are presented.

This set will therefore be an essential reference work for all of those working in relevant fields.

0-87849-951-2, hardcover, 2-vols. set  
**1230 pages, 2004, US\$362.00/€315.00**



## Materials Science, Testing and Informatics II

Ed. J. Gyulai  
Materials Science Forum Vols. 473-474

The series, "Hungarian Conference and Exhibition on Materials Science, Testing and Informatics", was founded in order to provide a forum in which Hungarian and foreign scientists and research groups - interested in metals and alloys, silicates, polymers and composites - would have the opportunity to exchange and publish ideas and to establish new integrated partnerships. The 4th Hungarian Conference and Exhibition on Materials Science, Testing and Informatics was held on the Balaton lakeside, at Balatonfüred, October 12-14th, 2003.

The following topics are covered in the proceedings: functional materials and technologies of the new millennium (including mechanical engineering, electrotechnics, energetics, ceramics, polymers, biotechnology, nanostructures, smart materials, gradient materials); modern research and characterization methods; modeling, simulation and materials informatics; innovative products and technologies.

The proceedings are therefore an invaluable source of up-to-date information on the field.

0-87849-957-1, paperback,  
**620 pages, 2005, US\$228.00/€198.00**



## Defects and Diffusion in Halides and Ice

A 7-Year Retrospective

Ed. D.J. Fisher  
Defect and Diffusion Forum Vol. 229

This seven-year retrospective covers the significant results, reported in these fields during that time, and includes abstracts of papers which appeared after the publication of Defect and Diffusion Forum, Volumes 150-151 and Volumes 181-182, (which were last to cover these topics systematically) and the end of August 2004 (allowing for vagaries of journal availability).

In addition to the abstracts, the issue includes invited original papers on the topics of: "Ionic Conduction and Relaxation in Some Superionic Fluoride Ion Conductors" (M.A.Ahmad), "Ionic Conductivity and Relaxation Dynamics in Fast Ion Conducting Silver Borate Glasses" (S.Bhattacharya & A.Ghosh) and "Dislocations in Ice and Deformation Mechanisms: from Single Crystals to Polar Ice" (M.Montagnat & P.Duval).

These invited papers and the 330 selected abstracts bring up to date the coverage of these important materials.

3-908451-03-5, paperback,  
**186 pages, 2004, US\$113.00/€98.00**

New

## Advanced Materials Forum II

Eds. Rodrigo Martins et al.  
Materials Science Forum Vols. 455-456  
0-87849-941-5, 2004, 890 pages,  
**US\$228.00/€198.00**

## Advances in Fracture and Failure Prevention

Eds. Kikuo Kishimoto et al.  
Key Engineering Materials Vols. 261-263  
0-87849-938-5, 2004, 1754 pages,  
**US\$446.00/€388.00**

## Advances in Grinding and Abrasive Processes

Ed. Xipeng Xu  
Key Engineering Materials Vols. 259-260  
0-87849-934-2, 2004, 902 pages,  
**US\$308.00/€268.00**

## Bioceramics 16

Eds. Mário A. Barbosa et al.  
Key Engineering Materials Vols. 254-256  
0-87849-932-6, 2004, 1166 pages,  
**US\$362.00/€315.00**

## Designing, Processing and Properties of Advanced Engineering Materials

Eds. S.-G. Kang and T. Kobayashi  
Materials Science Forum Vols. 449-452  
0-87849-939-3, 2004, 1378 pages,  
**US\$367.00/€319.00**

## Diamond Thin Films

An Emerging Technology: Past, Present and Future  
Ashok Kumar Dua  
Materials Science Foundations Vol. 21  
0-87849-949-0, 2004, 112 pages,  
**US\$60.00/€52.00**

## Diffusion and Defects Studies in Zirconium and some of its Alloys

R.P. Agarwala  
Materials Science Foundations Vol. 20  
0-87849-942-3, 2004, 91 pages,  
**US\$60.00/€52.00**

## Electroceramics in Japan VII

Eds. M. Miyayama et al.  
Key Engineering Materials Vol. 269  
0-87849-947-4, 2004, 264 pages,  
**US\$182.00/€158.00**

## Euro Ceramics VIII

Eds. Hasan Mandal and Lütfi Öveçoglu  
Key Engineering Materials Vols. 264-268  
0-87849-946-6, 2004, 2700 pages,  
**US\$684.00/€595.00**

## European Powder Diffraction

Eds. Yvonne Andersson et al.  
Materials Science Forum Vols. 443-444  
0-87849-935-0, 2004, 440 pages,  
**US\$205.00/€178.00**

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

## Defects and Diffusion in Semiconductors

An Annual Retrospective VII

Ed. D. Fisher

Defect and Diffusion Forum Vols. 230-232

This seventh volume in the series covering the latest results in the field includes abstracts of papers which appeared after the publication of Annual Retrospective VI.

In addition to the abstracts, the issue includes invited original papers on the topics of "The Characterization of Defects in Silicon Carbide Crystals by X-Ray Topography in the Back-Reflection Geometry" (W.M.Vetter), "Progress in Wide Band-Gap Ferromagnetic Semiconductors and Semiconducting Oxides" (S.J.Pearson et al.), "Calculating the Properties of Defects in Semiconductors at Finite Temperatures" (S.K.Estreicher & M.Sanati), "The Role of Cation Vacancy-Related Defects in Self-Assembling of CdSe Quantum Dots" (L.V.Borkovska, R.Beyer, et al.), "Radiation-Induced Defect Formation in Ternary Ge-As-S Vitreous Semiconductors" (R.Y.Golovchak & O.I.Shpotyuk), "First-Principles Calculations of Hydrogen Aggregation in Silicon" (P.R.Bridson et al.), "Anisotropy of Strain Relaxation in III-V Semiconductor Heterostructures" (O.Yastrubchak, T.Wosiński et al.), "On the Photo-Ionization Cross-Section of DX Centers" (E.Pączek-Popko), "Imaging and Characterizing Nanoscale Fluctuations in the Distribution of Dopant Atoms by Scanning Tunneling Microscopy" (P.Ebert), "Investigation and Identification of Transition Metals in p-Type Boron-Doped Silicon by Non-Invasive Techniques" (O.Palais & P.Hidalgo), "Classification of Defects on Semiconductor Wafers using Priority Rules" (N.G.Shankar et al.), "Grown-In Lattice Defects and Diffusion in Czochralski-Grown Germanium" (J.Vanhellemont, O.De Gryse et al.), etc.

These 16 invited papers and 763 selected abstracts together provide an up-to-date insight into current and future trends in semiconductor theory, processing and applications as related to diffusional phenomena and defect behavior.

3-908451-04-3, softcover,

**540 pages, 2004, US\$308.00/€268.00**

## Bulk and Graded Nanometals

Eds. K.J. Kurzydowski and Z. Pakiela  
Solid State Phenomena Vols. 101-102

In recent years, bulk and graded nanometals have attracted the growing interest of materials scientists. Nanometals can be obtained by using various methods: gas condensation or ball-milling with subsequent consolidation, thermal spray techniques, annealing of thin amorphous ribbons and severe plastic deformation. The plastic deformation methods include severe torsional straining under high pressures, equal channel angular pressing, cyclic extrusion compression - and others.

The increasing practical applications of nanostructured metals, or of metals with nanostructured coatings, make it even more important to carry out basic research in the field: including characterisation, microstructural transformation mechanisms, and modelling studies; with particular attention being paid to deformation mechanisms. Multi-scale analysis is required for treating those properties which depend upon the homogeneity of the microstructure, surface characteristics and - in particular - the geometries and properties of grain boundaries.

The aim of this book is to provide a timely review of the latest methods for obtaining bulk and graded nanometals, and for controlling their microstructures and physical properties; with particular regard to mechanical properties.

3-908451-02-7, paperback,

**364 pages, 2005, US\$205.00/€178.00**

New

## Advances in Nondestructive Evaluation

Eds. Seung-Seok Lee et al.

Key Engineering Materials Vols. 270-273

The aim of this 3-volume set is to bring together the expertise of scientists and engineers, in academia and industry, who are active in the field of non-destructive testing and evaluation. The papers cover activities which include analytical techniques as well as experimental case studies.

The set consists of over 390 papers. The headings of the various sections are: Materials Characterization, Signal and Image Processing, Ultrasonics, Guided Waves, Acoustic Emission, Eddy Current Testing, EMAT, Magnetic Methods, Optical Methods, NDE in the Electronics Industry, Industrial Applications, NDE in Agriculture, Microsensor/MEMS/Nano, Fatigue and Fracture, Radiography and Neutron Radiography, Acoustics and Vibration, Civil Infrastructure, Personnel Qualifications and Standards, Reliability, Composite Materials and Structures, Health Monitoring, Bio and Medical NDE, Smart Materials and Structures, Nuclear Industry, Welding.

0-87849-948-2, paperback,

**2524 pages, 3-vols. set, 2004, US\$539.00/€469.00**



## Science and Technology of Nanomaterials

New

Eds. M. Gupta and Christina Y.H. Lim

Journal of Metastable and Nanocrystalline Materials Vol. 23

Continued advances in the welfare of the human race depend upon the continual development of, and improvement in, the engineering devices that serve our day-to-day needs. Such development and improvement in engineering devices hinges primarily upon the availability of innovative materials which are capable of withstanding the most stringent service conditions. Materials with nano-level microstructural features make up one such class of material that has recently caught the imagination of researchers worldwide. These materials have demonstrated their potential to exhibit very unusual combinations of properties, and have convincingly confounded conventional beliefs.

The primary aim of this special issue is to present recent advances, made by researchers all over the world, in the area of nanomaterials.

0-87849-953-9, paperback,

**420 pages, 2005, US\$228.00/€198.00**

## Advances in Experimental Mechanics

New

Ed. M. Lucas

Applied Mechanics and Materials Vols. 1-2

The research contributions in the book represent the state-of-art in experimental techniques and model validation, and incorporate a diverse range of applications and disciplines in mechanics, including biomedical, automotive, structural, aerospace and sports engineering. The common theme of the research papers is experimental techniques, signifying the strength of experimental data in gaining physical insights into engineering materials, systems and structures. The proceedings consists of seven themes, which highlight the current major research topics: noise and vibration, composite structures, fatigue and fracture, optical techniques, sensor technology, high strain rate applications, and strain gauge applications.

The collection also offers a history of the key developments in experimental mechanics as chronicled by its journal "Strain".

0-87849-955-5, paperback,

**280 pages, 2004, US\$193.00/€168.00**



## Metastable and Nanostructured Materials II

New

Eds. R.H.G.A. Kiminami and L.A. Pessan

Following the success of the book "Metastable and Nanostructured Materials I", this edition was organized in order to provide up-to-date information for the reader interested in Metastable and Nanostructured Materials.

The book comprises 16 peer review papers. The selected papers cover a wide range of topics related to the synthesis, processing, characterization and properties of materials such as glassy alloys, amorphous alloys, metallic alloys, ionic conducting metallic glasses, magnetic materials, core-shell nanoparticles, ceramic nanopowders, melt-spun metallic ribbons and polymer nanocomposites..

0-87849-954-7, paperback,  
116 pages, 2004, **US\$113.00/€98.00**

## Diamond Thin Films

An Emerging Technology: Past, Present and Future

Ashok Kumar Dua

Materials Science Foundations Vol. 21

Diamond, as well as being a precious gem, is a versatile material par excellence. No other material comes anywhere near to matching its properties, which are both extreme, and also expressed in rare combinations.

This monograph deals with the past, present and future of diamond thin films. It details their methods of preparation and characterisation, and the mechanisms of nucleation, growth and epitaxy of CVD diamond. Reactor-scale modelling, in situ diagnostics and the processing of diamond films are other important topics that are covered. Expected applications, recent developments and new ideas in the field concluding the monograph. In the near future, applications featuring diamond parts may well grow into whole new industries, with their associated production facilities, supply chains and job opportunities; thereby benefiting society in general.

This book provides a brief, but complete and authoritative, introduction.

ISBN 0-87849-949-0,  
112 pages, paperback, 2004, **US\$60.00/€52.00**

## Advances in Materials Manufacturing Science and Technology

New

Eds. Xing Ai, Jianfeng Li and Chuanzhen Huang

Materials Science Forum Vols.471-472

This collection comprises a selection of over 180 papers; submitted to the editors by numerous universities and industrial concerns, and subjected to peer-review by at least two expert referees. The papers were selected on the basis of their quality, and their combined coverage of the main topics of the book.

As a result, the volume acquaints the reader with all of the recent advances made in the field of materials manufacturing technology; presented under the headings of: (i) materials forming and removal; (ii) designing, modelling and control of manufacturing processes; (iii) novel materials processing technology; (iv) intelligent manufacturing systems; (v) modern manufacturing engineering management, and (vi) applications of IT in manufacturing industry. This book will therefore be of great value to materials and manufacturing engineers, research students and academics working in the field.

0-87849-956-3, paperback,  
930 pages, 2004, **US\$343.00/€298.00**

## Functional Nanomaterials for Optoelectronics and other Applications

Eds. Witold Lojkowski et al.  
Solid State Phenomena Vols. 99-100  
3-908451-01-9, 2004, 310 pages,  
**US\$205.00/€178.00**

## High Temperature Corrosion and Protection of Materials 6

Eds. Pierre Steinmetz et al.  
Materials Science Forum Vols. 461-464  
0-87849-945-8, 2004, 1270 pages,  
**US\$367.00/€319.00**

## Metastable, Mechanically Alloyed and Nanocrystalline Materials

Eds. C.S. Kiminami et al.  
Journal of Metastable and  
Nanocrystalline Materials Vols. 20-21  
0-87849-944-X, 2004, 822 pages,  
**US\$305.00/€265.00**

## Nanodiffusion

Diffusion in Nanostructured Materials  
Ed. D.L. Beke  
Journal of Metastable and  
Nanocrystalline Materials Vol. 19  
0-87849-494-4, 2004, 190 pages,  
**US\$113.00/€98.00**

## Positron Annihilation

Eds. Toshio Hyodo et al.  
Materials Science Forum Vols. 445-446  
0-87849-936-9, 2004, 550 pages,  
**US\$205.00/€178.00**

## Progress in Advanced Materials and Processes

Eds. Dragan P. Uskokovic et al.  
Materials Science Forum Vols. 453-454  
0-87849-940-7, 2004, 600 pages,  
**US\$228.00/€198.00**

## Self-Formation Theory and Applications

Ed. Stepas Janušonis  
Solid State Phenomena Vols. 97-98  
3-908450-85-3, 2004, 510 pages,  
**US\$205.00/€178.00**

## Silicon Carbide and Related Materials

Eds. Roland Madar et al.  
Materials Science Forum Vols. 457-460  
0-87849-943-1, 2004, 1548 pages,  
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