

Tiny Technology... Huge Potential

ADVANCED MICRO & NANOSYSTEMS

AMN
www.AMN.wiley-vch.de

www.AMN.wiley-vch.de

Editors

HENRY BALTES,
ETH Zürich,
Zürich, Switzerland

OLIVER BRAND,
Georgia Institute of Technology,
Atlanta, USA

GARY K. FEDDER,
Carnegie Mellon University,
Pittsburgh, USA

CHRISTOFER HIEROLD,
ETH Zürich, Switzerland

JAN G. KORVINK,
IMTEK Freiburg, Germany

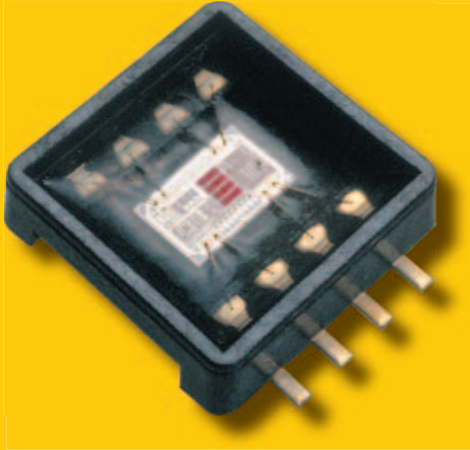
OSAMU TABATA,
Kyoto University, Kyoto, Japan

New Book Series



 **WILEY-VCH**

Save 10% with Your Continuation Order



www.AMN.wiley-vch.de

Microstructures, electronics, nanotechnology – vast fields of research are growing together as the size gap narrows. Current research, engineering successes and newly commercialized products hint at the immense innovative potential and future applications that may be opened up once mankind controls shape and function from the atomic level right up to the visible world without any gaps.

This new series, **Advanced Micro- and Nanosystems**, provides hot reviews from top authors on technologies, devices and advanced systems from these two domains.

Advanced Micro- and Nanosystems is the successor to **Sensors Update**, whose three experienced editors have invited a further three highly renowned experts from the USA, Europe and Japan to join the new editorial team so as to offer even broader coverage of the science and technology of the micro and nano worlds.

Published twice yearly, the volumes can be purchased either on a continuation order basis or individually. An attractive series price is available for continuation orders.

The Series to Keep Track of the Hottest Topics from the Micro and Nano Worlds

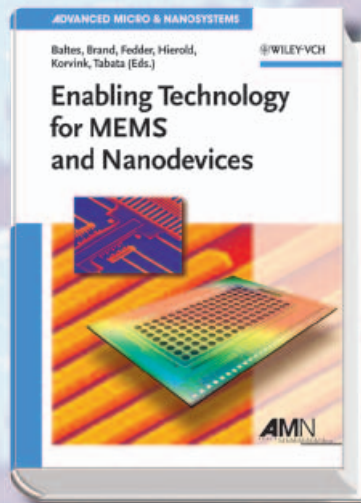
The International Editorial Team



The joint editors of AMN (from left to right):

Osamu Tabata, *Department of Mechanical Engineering at Kyoto University, Japan*
 Christofer Hierold, *Chair for Micro- and Nanosystems at ETH Zurich, Switzerland*
 Gary K. Fedder, *Department of Electrical and Computer Engineering and the Robotics Institute, Carnegie Mellon University, Pittsburgh, USA*
 Oliver Brand, *School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, USA*
 Henry Baltes, *Director of the Physical Electronics Laboratory, ETH Zurich, Switzerland*
 Jan G. Korvink, *Chair for Microsystem Technology, Albert Ludwig University, Freiburg, Germany*

For more information on the AMN Series and the editors please visit www.AMN.wiley-vch.de



Volume Editors:

Henry Baltes, Oliver Brand, Gary K. Fedder, Christofer Hierold, Jan.G. Korvink and Osamu Tabata

Enabling Technology for MEMS and Nanodevices

Contents:

MEMS Technologies and Applications:

- M3 – The Third Dimension of Silicon
- Trends in MEMS Commercialization
- Capacitive Interfaces for MEMS
- MEMS Packaging of Advanced Micro and Nanosystems
- Polymer MEMS
- HF Integrated Microelectromechanical Resonators and Filters
- MEMS in Mass Storage Systems
- Scanning Micro- and Nanoprobes for Electrochemical Imaging

Nanodevice Technologies and Applications:

- Nanofluidic Simulations
- Nanofluidics – Structures and Devices
- Carbon Nanotube Sensors
- CMOS-based DNA Sensor Arrays

3527-30746-X June 2004 439pp with 245 figs and 15 tabs Hbk approx € 189.- /£ 135.- /US\$ 245.-

Series price € 169.- /£ 120.- /US\$ 205.-



CMOS-MEMS

Contents:

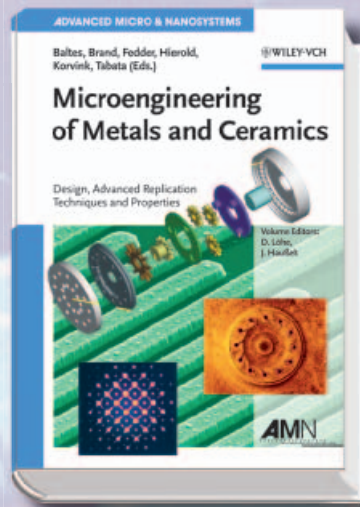
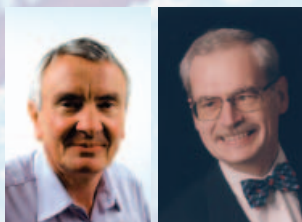
- Introduction
- Fabrication Technology
- Material Characterization
- CMOS-based Pressure Sensors
- CMOS-based Inertial Sensors
- CMOS-based Acoustic Sensors
- CMOS-based RF-MEMS
- CMOS-based Chemical Sensors
- CMOS-based Biometric Sensors
- CMOS-based Biological Sensors
- CMOS-based Thermal Sensors
- Circuit and System Integration
- Assembly and Packaging

3527-31080-0 December 2004
 approx 600pp with approx 250 figs and
 approx 25 tabs Hbk
 € 189.- /£ 135.- /US\$ 245.-

Series Price € 169.- /£ 120.- /US\$ 205.-

Volume Editors:

Oliver Brand and Gary K. Fedder



Microengineering of Metals and Ceramics

Design, Advanced Replication Techniques and Properties

Contents:

- **Design:** Design Environment and Design Flow; Modelling and Validation; Micro Powder Injection Process Modelling
- **Tooling:** Mould Insert Manufacturing Strategies; Micro End-milling; 3D-Laser Ablation, Micro EDM, Lithographic Fabrication, Material States, Surface Conditioning
- **Replication Techniques:** Micro Injection Moulding; Micro Ceramic Injection Moulding; Micro Casting; Micro Electroforming; Micro EPD, Tape Embossing, Slip Casting
- **Automation and Quality Assurance:** PIM Automation; Assembly; and Dimensional Measurement
- **Properties of Materials and Micro-Components:** Structures and Properties; Tribological Characterization; Wear Simulation Tool Development

3527-31208-0 May 2005 approx 400pp with
 approx 250 figs and approx 25 tabs Hbk
 € 189.- /£ 135.- /US\$ 245.-

Series price € 169.- /£ 120.- /US\$ 205.-

Volume Editors:

Detlef Löhe (left), *Director of the Institute of Materials Science and Engineering I, University of Karlsruhe, Germany*

Jürgen Haußelt (right), *Director of the Institute of Materials Research III at Forschungszentrum Karlsruhe and Chair for Micromaterials Process Technology at IMTEK Freiburg, Germany*

Special Features

- Hot reviews from top authors on technologies, devices and advanced systems
- Expert coverage of current breakthroughs in all important fields
- Contents range from concepts through applications to commercialization
- Series provides ideal overview while dedicated volumes offer detailed insights into selected areas

Benefits for You

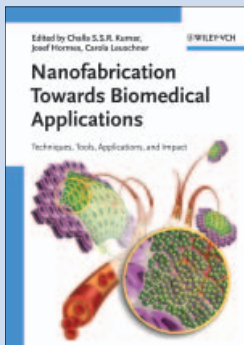
- Covers one of today's hottest research topics
- Discusses all important fields of micro- and nanotechnology, such as microelectronics, MEMS, sensors, actuators, micro- and nanostructuring techniques, optical circuitry, biosystems
- Provides top-of-the-line reviews with ample references to keep track of all relevant original literature
- Provides textbook and source book knowledge: a quick start for newcomers and a comprehensive overview for experienced readers
- Targets all disciplines – from biology, biochemistry and chemistry through materials science to physics, mathematics and engineering, both in academia as well as in industry
- Examines applications in important future growth markets, e.g., electronics, IT, bioengineering, environment, energy, and safety
- Helps building an interdisciplinary network of specialists

Related Titles

Nanofabrication Towards Biomedical Applications Materials and Methods

Edited by CHALLA KUMAR, JOSEF HORMES, and CAROLA LEUSCHNER

With its focus on the materials, synthetic methods, tools and techniques being developed in the nanoregime towards the life sciences, this book provides readers from materials science, engineering, chemistry, biology and medicine with detailed accounts of the design and synthesis of nanomaterials and the tools and techniques involved in their production.



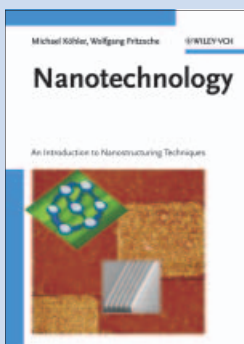
3527-31115-7
January 2005
approx 450pp
with approx
270 figs, 20 in
color Hbk
approx
€ 159.- /
£ 115.- /
US\$ 215.-

Nanotechnology

An Introduction to Nanostructuring Techniques

MICHAEL KÖHLER and WOLFGANG FRITZSCHE

Written for both scientists and engineers, this book offers fascinating insight into nanotechnology from the fundamentals of microtechnology and chemistry to the fabrication and of nanostructures and finally presenting characterization.

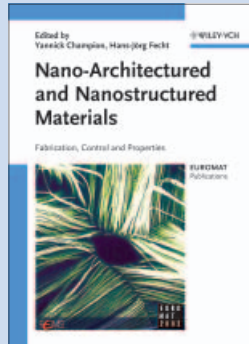


3527-30750-8
February 2004
284pp with
143 figs and
9 tabs Hbk
€ 119.- /
£ 85.- /
US\$ 155.-

Nano-Architected and Nanostructured Materials Fabrication, Control and Properties

Edited by YANNICK CHAMPION and HANS-JÖRG FECHT

The book places special emphasis on crucial technical aspects of the fabrication, the control and the characterisation of complex nano-architectures.



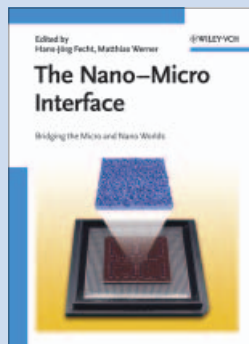
3527-31008-8
September 2004
166pp with 101
figs and 16 tabs
Hbk
€ 89.- / £ 65.- /
US\$ 150.-

The Nano Micro Interface

Bringing the Nano and Micro Worlds Together

Edited by HANS-JÖRG FECHT and MATTHIAS WERNER

This book covers a wide range of topics – from technologies to materials and devices, and from research to administrative know-how.



3527-30978-0
2004 364pp
with 102 figs,
34 in color, and
27 tabs Hbk
€ 99.- / £ 70.- /
US\$ 135.-

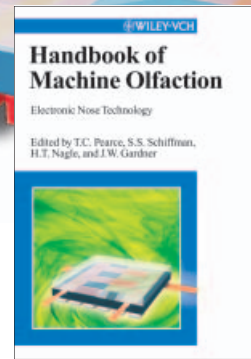
Introduction to Nanotechnology

CHARLES P. POOLE and FRANK J. OWENS

„...wonderful introductory overview...an invaluable interdisciplinary look at the science of miniaturization and mesoscopic materials...an important resource for technical administrators and managers, as well as students and individuals...“
- *Polymer News*



0471-07935-9 2003
approx 320pp Hbk
€ 72.90 / £ 47.50 /
US\$ 79.95

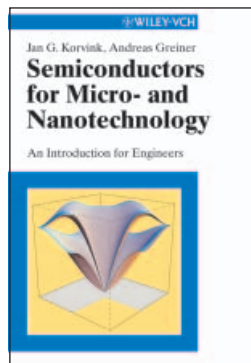


Handbook of Machine Olfaction Electronic Nose Technology

Edited by TIM C. PEARCE, SUSAN S. SCHIFFMANN, H. TROY NAGLE and JULIAN W. GARDNER

“...This book is a valuable information source...This reviewer was captivated that he ended up with enough notes for a book review of several thousand words!”
Measurement & Control

3527-30358-8 2002 624pp with 267 figs,
29 in color, and 46 tabs Hbk
€ 235.- / £ 165.- / US\$ 305.-



Semiconductors for Micro- and Nanotechnology

An Introduction for Engineers

JAN G. KORVINK and ANDREAS GREINER

This textbook emphasizes a system-oriented view of semiconductor physics for applications in microsystem technology. It provides a hands-on approach to semiconductor physics tailor-made for engineering students.

3527-30257-3 2002 324pp with 98 figs and
4 tabs Hbk
€ 52.90 / £ 37.50 / US\$ 69.95

All prices are approx prices and subject to change

Related Titles



Sensors in Medicine and Health Care

Sensors Applications Vol. 3

Edited by P. AKE OEBERG, TATSUO TOGAWA, and FRANCIS A. SPELMAN

A review of applications for point-of-care diagnostics, their integration into portable systems and the comfortable, easy-to-use sensors that allow patients to monitor themselves at home. The book covers such advanced topics as minimal invasive surgery, implantable sensors and prostheses, as well as biocompatible sensing.

3527-29556-9 2004 444pp with 219 figs, 6 in color, and 7 tabs Hbk
€ 229.- /£ 160.- /US\$ 330.-
Series price € 199.- /£ 120.- /US\$ 280.-

Sensors in Manufacturing

Sensors Applications Vol. 1

Edited by HANS KURT TÖNSHOFF and ICHIRO INASAKI

3527-29558-5 2001 426pp with 312 figs and 18 tabs Hbk
€ 259.- /£ 180.- /US\$ 340.-
Series price € 209.- /£ 120.- /US\$ 280.-

Sensors in Intelligent Buildings

Sensors Applications Vol. 2

Edited by OLIVER GASSMANN and HANS MEIXNER

3527-29557-7 2001 610pp with 351 figs and 36 tabs Hbk
€ 259.- /£ 180.- /US\$ 340.-
Series price € 209.- /£ 120.- /US\$ 280.-

Sensors for Automotive Technology

Sensors Applications Vol. 4

Edited by JIRI MAREK, HANS-PETER TRAH, YASUTOSHI SUZUKI and IWAO YOKOMORI

Leading international experts give a detailed picture of existing as well as future sensor applications for vehicle safety, fuel consumption, air conditioning, emergency control, traffic control systems, and electronic guidance using radar and video.

3527-29553-4 2003 584pp with 450 figs and 50 tabs Hbk
€ 259.- /£ 180.- /US\$ 340.-
Series price € 229.- /£ 180.- /US\$ 280.-

Sensors in Household Appliances

Sensors Applications Vol. 5

Edited by GUIDO TSCHULENA and ANDREAS LAHRMANN

Product safety, efficiency and consumer comfort, as well as decreasing power or water consumption and wastewater play important roles for the customer appeal of advanced "intelligent" appliances.

3527-30362-6 2003 310pp with 153 figs and 32 tabs Hbk
€ 189.- /£ 135.- /US\$ 235.-
Series price € 159.- /£ 120.- /US\$ 280.-

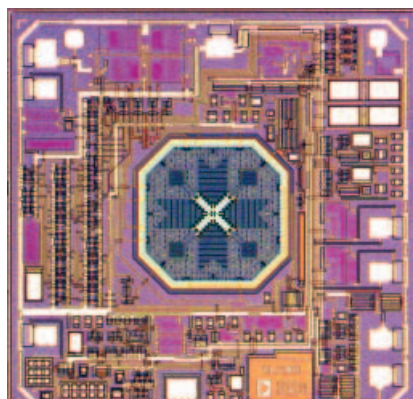
Sensors Update

Edited by HENRY BALTES, GARY K. FEDDER, and JAN G. KORVINK

Volume 12
3527-30602-1 2003 262pp with 162 figs and 31 tabs Hbk

Volume 13
3527-30745-1 February 2004 324pp with 203 figs and 19 tabs Hbk

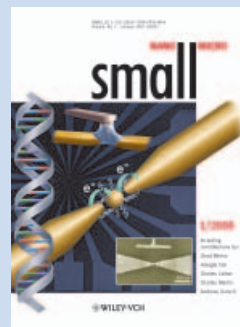
Each volume:
€ 229.- /£ 160.- /US\$ 300.-
Series price € 209.- /£ 120.- /US\$ 280.-



Related Journals ...

...bring you the latest and most exciting progress in materials science

Small

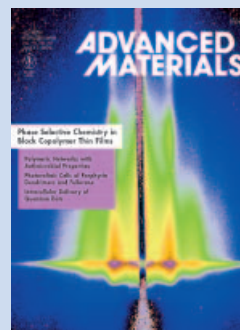


The NEW inter-disciplinary journal for nano and micro science and technology

ISSN: 1613-6810 (print), 1613-6829 (online)
2005, Volume 1, 12 Issues

www.small-journal.com

Advanced Materials

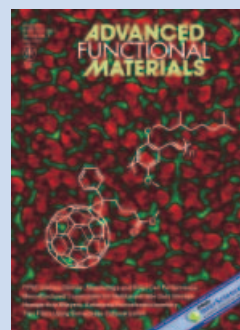


ISI Impact factor 7.305

ISSN: 0935-9648 (print), 1521-4095 (online)
2005, Volume 17, 24 Issues

www.advmat.de

Advanced Functional Materials



ISI Impact Factor 4.798

ISSN: 1616-301X (print), 1616-3028 (online)
2005, Volume 15, 24 Issues

www.afm-journal.de

Online Sample Copies are now available at www.interscience.wiley.com and are FREE to registered users. For complete pricing information on the journals mentioned in this brochure please contact your local subscription agent or visit: www.interscience.wiley.com

Order Form

I would like to order:
(Please insert ISBN and title)

All customers from Europe (excluding Germany, Austria, Switzerland)

PHONE your credit card order:
DIAL FREE (UK only) 0800 243407 or
(for overseas orders) +44 (0) 1243 843-294.
Please quote the Campaign Ref. number.
FAX your completed order form to:
+44 (0) 1243 843-296
POST your completed order form to:
John Wiley & Sons Ltd., 1 Oldlands Way,
Bognor Regis, West Sussex, PO22 9SA England
EMAIL: cs-books@wiley.co.uk – Please quote
the Campaign Ref. number and include your
postal delivery address.
INTERNET: www.wiley-europe.com

DELIVERY

Postage rates (Amounts shown for the total order)

UK £3.00

Europe

Surface mail £4.50/€7.40 Air mail £10.50/€17.30

Outside Europe

Surface mail £6.60 Air mail £13.25

Delivery will be arranged by John Wiley & Sons Ltd, on your behalf
via Wiley Distribution Services Ltd. Alternatively you may collect your
order by prior arrangement. We can also quote for delivery by courier.
Please e-mail cs-books@wiley.co.uk for details.
Please allow 21 days for delivery.

MONEY BACK GUARANTEE

If you are not completely
satisfied we will refund your
payment without question,
if books are returned in a
resaleable condition within
30 days of receipt.

Sub Total _____

Postage _____

TOTAL _____

PAYMENT METHODS

- Cheque enclosed, payable to
John Wiley & Sons Ltd
 Credit/charge card
 Switch Mastercard Visa
 American Express Diners Club

Card Number _____

Start Date _____ Expiry Date _____

Switch issue number _____

Card Security Code _____

Required for Switch, Mastercard, Visa, American
Express

Cardholder's Signature _____

Cardholder's Name _____

Cardholder's registered Address _____

Postcode _____

Country _____

Telephone _____

E-mail _____

Invoice for prepayment

Purchase order number _____ enclosed

EU customers please include your VAT number _____

Customers from Germany, Austria and Switzerland

PHONE +49 (0) 6201 606-400
FAX your completed order form to:
+49 (0) 6201 606-184
POST your completed order form to:
Wiley-VCH, Customer Service Department,
P.O. Box 10 11 61, 69451 Weinheim, Germany
EMAIL: service@wiley-vch.de
INTERNET: www.wiley-vch.de

TERMS OF PAYMENT:

- Please send me an invoice Cheque is enclosed
Please charge my credit card:
 Mastercard Visa Amex

Card Number _____

Expiry Date _____

Date, Signature _____

Customers from the Rest of the World

PHONE +1 877 762-2974 (toll free!)
FAX +1 800 597-3299
MAIL your completed order form to:
John Wiley & Sons, Inc., 10475 Crosspoint Blvd,
Indianapolis, IN 46256 USA
EMAIL: custserv@wiley.com
INTERNET: www.wiley.com

METHOD OF PAYMENT:

- Payment enclosed. Total amount enclosed:
_____(Make checks or money orders payable
to John Wiley & Sons, Inc.)

Please charge my credit card:

- Mastercard Visa Amex Discover

Acct.# _____

Expiry Date _____

Signature (Credit card orders invalid unless signed) _____

BOOKS

____copy(ies) **Advanced Micro &
Nanosystems (Book Series)**
Save 10% with your continuation order
Series price approx € 169.-/£ 120.-/US\$ 205.-
per volume
Each volume will be invoiced and despatched
upon publication.

____copy(ies) **Enabling Technology for MEMS
and Nanodevices**
€ 189.-/£ 135.-/US\$ 245.-/ISBN 3527-30746-X

____copy(ies) **CMOS-MEMS**
€ 189.-/£ 135.-/US\$ 245.-/ISBN 3527-31080-0

____copy(ies) **Microengineering of Metals and
Ceramics**
€ 189.-/£ 135.-/US\$ 245.-/ISBN 3527-31208-0

____copy(ies) _____

____copy(ies) _____

____copy(ies) _____

- Yes! Please place me on the Wiley E-mail list.
My email address is _____

JOURNALS

Yes, please send me my free sample copy of

- Small Advanced Materials
 Advanced Functional Materials
 print electronic

CAMPAIGN REF.: ?????

Send my order to (Please use CAPITALS):

- private business Mr. Mrs.

Title & Name _____

E-mail _____

Job Title _____

Department _____

Company/University _____

Address _____

Town/City _____

Country/State _____

Post/Zip Code _____

Daytime Tel. _____

Fax _____

Date/Signature _____

903909

 **WILEY**

 **WILEY-VCH**

In EU countries the local VAT is effective for books and journals. Postage will be charged. Whilst every effort is made to ensure that the contents of this leaflet are accurate, all information is subject to change without notice. Our standard terms and delivery conditions apply. Prices are subject to change without notice. Date of Information: September 2004