

T. Vogt, University of South Carolina, Columbia, SC, USA; W. Dahmen, RWTH Aachen, Germany; P. Binev, University of South Carolina, Columbia, SC, USA (Eds)

Modeling Nanoscale Imaging in Electron Microscopy

Features

► Focuses solely on the modeling of microscopy, not the instrumentation ► First book in the field since 1998 ► Based on the lectures series at the Wolfgang Dahmen Research Seminar on "Imaging in Electron Microscopy"

Contents

Introduction.- Statistical and Information-Theoretic Analysis of Resolution in Imaging.- (Scanning) Transmission Electron Microscopy: Overview and Examples for the Non-Microscopist.- Seeing Atoms in the Crossroads of Microscopy and Mathematics.- Kantianism at the Nanoscale.- Reference free cryo-EM algorithms using self-consistent data fusion I.- Reference free cryo-EM algorithms using self-consistent data fusion II.- Applications of multivariate statistical analysis for large-scale spectrum-image datasets and atomic-resolution images.- Compressed Sensing.- Imaging the behavior of atoms, clusters and nanoparticles during elevated temperature experiments in an aberration-corrected electron microscope.- Towards Quantitative Imaging using Aberration Correction and Exit Wave Reconstruction.- Image registration, classification and averaging in cryo-electron tomography.- (Scanning) Transmission Electron Microscopy with High spatial, temporal and energy resolution.- Fluctuation Microscopy: Nanoscale Order in Amorphous Materials from Electron Nanodiffraction.- Information in super-resolution microscopy and automated analysis of large-scale calcium imaging data.- Concluding remarks on Imaging in Electron Microscopy.

Fields of interests

Characterization and Evaluation of Materials; Analytical Chemistry; Nanotechnology

Target groups

Research

Product category

Monograph

Due March 2012

2012. XV, 265 p. 80 illus., 32 in color. (Nanostructure Science and Technology) Hardcover

► \$129.00

ISBN 978-1-4614-2190-0



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M.-H. Yu, Xi'an Jiaotong University, China; J.-C. Li, Nanyang Technological University, Singapore

Computational Plasticity

With Emphasis on the Application of the Unified Strength Theory

Features

► Focusing on unified strength theory as a very broad and flexible theory for many materials ► Contains new computational results that can be easily adapted for more structures ► Provides method to increase admissible loads or decrease cross-sections and the weight of the structure

Contents

Introduction.- Stress and Strain.- Material Models in Computational Plasticity.- Unified Strength Theory and Its Material Parameters.- Non-Smooth Multi-Surface Plasticity.- Implementation of the Unified Strength Theory into FEM Codes.- Examples of the Application of Unified Elasto-Plastic Constitutive Relations.- Strip with a Circular Hole under Tension and Compression.- Plastic Analysis of Footing Foundation Based on the Unified Strength Theory.- Underground Caves, Tunnels and the Excavation of Hydraulic Power Station.- Implementation of the Unified Strength Theory into ABAQUS and its Application.- 2D Simulation of Normal Penetration Using the Unified Strength Theory.- 3D Simulation of Normal and Oblique Penetration and Perforation.- Underground Mining.- Reinforced Concrete Beam and Plate.- Stability Analysis of Underground Caverns Based on the Unified Strength Theory.- Stability of Slope.- Unified Strength Theory and FLAC.- Mesomechanics and Multiscale Modelling for Yield Surface.- Miscellaneous Issues: Ancient Structures, Propellant of Solid Rocket, Parts of Rocket and Generator.

Fields of interests

Materials Science, general; Mechanical Engineering; Civil Engineering

Target groups

Research

Product category

Monograph

Due February 2012

Jointly published with Zhejiang University Press

Distribution rights in China: Zhejiang University Press

2012. 400 p. 250 illus., 50 in color. (Advanced Topics in Science and Technology in China) Hardcover

► \$219.00

ISBN 978-3-642-24589-3



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D. Zhang, Shanghai Jiao Tong University, China (Ed)

Morphology Genetic Materials Templated from Nature Species

Morphology Genetic Materials Templated from Nature Species provides a comprehensive and up-to-date coverage of research on bio-inspired functional materials including materials science and engineering aspects of the fabrication, properties, and applications. The book discusses bio-inspired strategies integrating biotemplate, biomaterialization, and biomimesis in nature, which are adopted to fabricate functional materials with hierarchical bio-architectures and interrelated outstanding performances, as well as valuable applications in photoelectricity, photonics, photocatalysis, chemical detection, bio-imaging, and photoelectron transfer components/devices. The book is intended for researchers and graduate students in the fields of materials science, chemistry, nanotechnology, semiconductor, biotechnology, environmental engineering, etc. Prof. Dr.

Features

► Perhaps the first book-length treatment devoted solely to a promising group of materials: morphogenetic materials ► Introduces morphogenetic fabrication, which directly incorporates the bio-composition of a natural species into fabricated functional materials ► Discusses bio-inspired strategies integrating biotemplates, biomaterialization, and biomimesis in nature

Contents

Functional Materials Templated from Natural Plants.- Morph-Genetic Materials Inspired from Butterfly Wing Scales.- Morph-Genetic Materials Inspired Diverse Hierarchical Bio-Architectures.- Morph-Genetic Composites.

Fields of interests

Biomaterials; Biophysics and Biological Physics; Biochemistry, general

Target groups

Research

Product category

Monograph

Due February 2012

Jointly published with Zhejiang University Press

Distribution rights in China: Zhejiang University Press

2012. Approx. 300 p. 365 illus., 15 in color. (Advanced Topics in Science and Technology in China)

Hardcover

► \$169.00

ISBN 978-3-642-24684-5



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Y. Ben-Zion, C. Sammis, University of Southern California, Los Angeles, CA, USA (Eds)

Brittle Deformation of Solid and Granular Materials with Applications to Mechanics of Earthquakes and Faults

Contents

Introduction by Ben-Zion, Y. and C. G. Sammis.- Slip sequences in laboratory experiments resulting from inhomogeneous shear as analogs of earthquakes associated with a fault edge by Rubinstein, S. M., I. Barel, Z. Reches, O. M. Braun; M. Urbakh and J. Fineberg.- Singular elasto-static field near a fault kink by Arias, R., R. Madariaga, and M. Adda-Bedia.- The Micromechanics of Brittle Solids in Triaxial Compression by Bhat, H. S., C. G. Sammis and A. J. Rosakis.- The elastic strain energy of damaged solids with applications to nonlinear deformation of crystalline rocks by Hamiel, Y., V. Lyakhovsky and Y. Ben-Zion.- Slow Dynamics of Earth Materials: An Experimental Overview by Ten Cate, J. A.- A unifying phase diagram for the dynamics of sheared solids and granular materials by Ben-Zion, Y., Dahmen, K. A. and J. T. Uhl.- Granular controls on periodicity of stick-slip events: kinematics and force-chains in an experimental fault by Hayman, N. W., L. Ducloux; K. L. Foco and K. E. Daniels.- Stick-Slip and the transition to Sliding in a 2D Granular Medium and a Fixed Particle Lattice by Krim, J., P. Yu, and R. P. Behringer.- Breaking up: comminution mechanisms in sheared fault gouge by Mair, K. and S. Abe.- The Mechanical Coupling of Fluid-Filled Granular Material Under Shear by Goren, L., E. Aharonov, D. Sparks and R. Toussaint.- The Role of Adsorbed Water on the Friction of a Layer of Submicron Particles by Sammis, C. G., D. A. Lockner and Z. Reches. [...]

Fields of interest

Structural Geology

Target groups

Research

Product category

Monograph

Due December 2011

2012. VI, 302 p. (Pageoph Topical Volumes) Softcover
 ► approx. \$69.95
 ISBN 978-3-0348-0253-6



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V. Ferronsky, Water Problems Institute of the Russian Academy of Sciences, Moscow, Russia; V. Polyakov, Institute of Hydrogeology and Engineering Geology, Moscow, Russia

Isotopes of the Earth's Hydrosphere

Contents

Part I. Stable Isotopes 1. Isotope geochemistry of natural waters.- 2. Isotopic composition of ocean water.- 3. Isotopic composition of atmospheric moisture.- 4. Isotopic composition of surface continental water.- 5. Isotopic composition of water of the unsaturated and saturated zones.- 6. Isotopic composition of formation water.- 7. Hydrogen and oxygen isotopic composition of sedimentary rocks and implications for palaeothermometry.- 8. Hydrogen and oxygen isotopic composition of groundwater in volcanic regions.- 9. Hydrogen and oxygen isotopic composition in minerals of magmatic and metamorphic rocks and fluid inclusions.- 10. Other stable isotopes in the hydrosphere.- Part II. Cosmogenic Isotopes 11. Origin and production of cosmogenic isotopes.- 12. The distribution of tritium.- 13. The distribution of radiocarbon.- 14. The other cosmogenic isotopes in natural waters.- Part III. Radiogenic Isotopes 15. Production and distribution of radiogenic isotopes.- 16. Dating of groundwater and sediments.- Part IV. Applications 17. Applications to the problems of dynamics of natural waters.- 18. Palaeohydrology of the Aral-Caspian basin.- 19. The nature and mechanism of the Earth shell separation and origin of the hydrosphere.

Fields of interests

Geochemistry; Hydrogeology; Environmental Science and Engineering

Target groups

Research

Product category

Monograph

Due April 2012

2012. X, 540 p. 302 illus. Hardcover
 ► \$229.00
 ISBN 978-94-007-2855-4



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I. Haapala, Espo, Finland (Ed)

From the Earth's Core to Outer Space

Contents

Introduction.- I. Evolving Earth's Crust.- 1. Paleo-Mesoproterozoic assemblages of continents – paleomagnetic evidence for near equatorial supercontinents.- 2. Seismic structure of Earth's crust in Finland.- 3. Evolution of the bedrock of Finland: An overview.- 4. Craton mantle formation and structure of Eastern Finland mantle: Evidence from kimberlite-derived mantle xenoliths, xenocrysts and diamonds.- 5. Metallic mineral resources in Finland and Fennoscandia – a major European raw-materials source for the future.- 6. Isotopic microanalysis – in situ constraints on the origin and evolution of the Finnish Precambrian.- 7. Fennoscandian land uplift: past, present and future. II. Changing Baltic Sea.- 8. Ice season in the Baltic Sea and its climatic variability.- 9. Baltic Sea water exchange and oxygen balance.- 10. Marine carbon dioxide.- 11. Impact of climate change on biology of the Baltic Sea. III. Climate Change.- 12. Evolution of Earth's atmosphere.- 13. Late Quaternary climate history of Northern Europe.- 14. Aerosols and climate change.- 15. Enhanced greenhouse effect and climate change in northern Europe.- 16. Will there be enough water? IV. Planet Earth, the third stone from the Sun.- 17. Trends in space weather since the 19th century.- 18. Space weather: From solar storms to the technical challenges of space age.- 19. Space geodesy – observing global changes.- 20. Destination Mars.- 21. In search of a living planet.

Fields of interests

Earth System Sciences; Climate Change; Physical Geography

Target groups

Research

Product category

Monograph

Due February 2012

Translation from Finnish

2012. X, 280 p. 122 illus., 87 in color. (Lecture Notes in Earth Sciences, Volume 137) Hardcover
 ► approx. \$139.00
 ISBN 978-3-642-25549-6



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M. E. Lazaridou-Varotsos, University of Athens, Greece

Earthquake Prediction by Seismic Electric Signals

The success of the VAN method over thirty years

Contents

1. Earthquakes, seismology, the van earthquake prediction method.- 2. How the van research on earthquakes prediction started.- 3. The procedure for the measurements, the telemetric van network and how we predict the epicenter and magnitude.- 4. First international evaluation of van in 1984.- 5. The powerful earthquakes of 1986.- 6. The disastrous earthquakes in killini-vartholomio (w. greece) in 1988. Public warning issued by haroun tazieff.- 7. The french interest on van (1986-1989). The book of haroun tazieff (1989) and the interruption of the van network (1989). - 8. Second international evaluation of van in 1990. Conference supported by onassis foundation. -9. The disastrous earthquakes in pirgos (w. greece) in 1993: the public warning.- 10. Third evaluation of van: the international conference at california (lake arrowhead) in 1992 and its follow-up at berkeley in 1995.- 11. The united nations recommendation on van in 1994 and the preceding earthquakes.- 12. Van evaluation by the royal society of london in 1995 and by the american geophysical union in 1996.- 13. The 6.0 earthquake at chalkidiki (n. greece) in 1995. The government verifies the success of prediction.- 14. The 6.6 earthquake at grevena-kozani (n. greece) in 1995.- 15. The disastrous 6.5 earthquake at erateini-egion (central greece) on 15 june 1995.- 16. The international prize of onassis foundation in 1995.- 17. The disastrous 5.9 athens earthquake in 1999.- 18. Proposal for a new concept of time and its applications. [...]

Fields of interests

Geophysics/Geodesy; Geology; Earth Sciences, general

Target groups

Research

Product category

Monograph

D. Matanovic, M. Cikes, B. Moslavac, University of Zagreb, Croatia

Sand Control in Well Construction and Operation

Produced sand causes a lot of problems. From that reasons sand production must be monitored and kept within acceptable limits. Sand control problems in wells result from improper completion techniques or changes in reservoir properties. The idea is to provide support to the formation to prevent movement under stresses resulting from fluid flow from reservoir to well bore. That means that sand control often result with reduced well production. Control of sand production is achieved by: reducing drag forces (the cheapest and most effective method), mechanical sand bridging (screens, gravel packs) and increasing of formation strength (chemical consolidation).

Features

► The book covers all aspects of sand control ► Designed as a comprehensive source of information on sand control in theory and practice for young professionals ► It describes in detail how to design a sand control systems according to recent technology and science knowledge

Contents

Introduction.- Reasons for sand production and prediction possibilities.- Obtaining relevant formation data and samples.- Sand control techniques.- Treatment fluid selection.- Gravel ? pack design.- Screen design.- Chemical consolidation design.- Frack packing.- Perforating for sand control.- Surface equipment (pumping, mixing, filtering).- Down hole equipment.- Sand control method selection.- Bibliography.- Index of relevant terms.

Fields of interests

Geotechnical Engineering & Applied Earth Sciences; Hydrogeology; Soft and Granular Matter, Complex Fluids and Microfluidics

Target groups

Research

Product category

Monograph

M. Reckermann, Helmholtz-Zentrum Geesthacht, Germany

K. Brander, B. R. MacKenzie, Technical University of Denmark, Charlottenlund, Denmark; A. Omstedt, University of Gothenburg, Göteborg, Sweden (Eds)

Climate Impacts on the Baltic Sea: From Science to Policy

School of Environmental Research - Organized by the Helmholtz-Zentrum Geesthacht

The Baltic Sea area is an old cultural landscape with a well developed international framework for monitoring, assessing and managing its marine ecosystems. It provides a good case study for other regions where such management is being set up.

Features

► Interdisciplinary view on climate change impacts on the (Baltic) sea ► Bridges the gap to policy making and sustainable environmental management ► Good case study for other regions in the process of setting up similar management

Contents

Preface.- 1 International agreements and Baltic Sea environmental management.- 2 HELCOM Baltic Sea Action Plan: An ecosystem approach to the management of human activities.- 3 Some aspects of the Baltic Sea marine system.- 4 A basic introduction to climate modeling and its uncertainties.- 5 Impacts of climate change, including acidification, on marine ecosystems and fisheries.- 6 Towards Integrated Ecosystem Assessments (IEAs) of the Baltic Sea - Investigating ecosystem state and historical development.- 7 Sustainable climate science.

Fields of interests

Geotechnical Engineering & Applied Earth Sciences; Climate Change; Oceanography

Target groups

Research

Product category

Contributed volume

Due February 2012

2012. 400 p. 175 illus., 90 in color. (Springer Geophysics) Hardcover
► approx. \$179.00
ISBN 978-3-642-24405-6



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Due February 2012

2012. X, 218 p. 97 illus., 78 in color. (Springer Environmental Science and Engineering) Hardcover
► \$129.00
ISBN 978-3-642-25613-4



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Due February 2012

2012. VIII, 260 p. 1 illus. in color. (Springer Earth System Sciences) Hardcover
► approx. \$139.00
ISBN 978-3-642-25727-8



P. Schäfer, University of Kiel, Germany

IBA Volume

Contents

1. Distribution over Space and Time in Epizoobiontic North Sea Bryozoans.- 2. The World's Oldest-Known Bryozoan Reefs: Late Tremadocian, mid-Early Ordovician: Yichang, Central China.- 3. Molecular Distance and Morphological Divergence in Cauloramphus (Cheilostomata: Calloporidae).- 4. Acanthocladia (Rhabdomesina, Cryptostomata) from the Devonian of Europe.- 5. Growth Rates, Age Determination and Calcification Levels in Flustra foliacea (L.) (Bryozoa: Cheilostomata) – Preliminary Assessment.- 6. Life on the Edge – Parachnoidea (Ctenostomata) and Barentsia (Kamptozoa) on Bathymodiolin Mussels from an Active Submarine Volcano in the Kermadec Volcanic Arc.- 7. Occurrence and Identity of “White Spots” in Phylactolaemata.- 8. Testing Habitat Complexity as a Control over Bryozoan Colonial Growth Form and Space Distribution.- 9.- Distribution and Diversity of Erect Bryozoan Assemblages along the Pacific Coast of Japan.- 10. Epizoid Bryozoans on Predatory Pycnogonids from the South Orkney Islands, Antarctica: “If you can't beat them, join them”.- 11. Growth Rate of Selected Sheet-Encrusting Bryozoan Colonies along a Latitudinal Transect – Preliminary Results.- 12. Patterns of Magnesium-Calcite Distribution in the Skeleton of some Polar Bryozoan Species.- 13. Seagrass-Associated Bryozoan Communities from the Late Pliocene of the Island of Rhodes (Greece).- 14. A New Species of the Genus Electra (Bryozoa, Cheilostomata) from Southern Oman, Arabian Sea.- 15. Molecular Phylogenetic Analysis Confirms the Species Status of Electra verticillata.- 16. Large Sediment Encrusting Trepostome Bryozoans from the Permian of Tasmania, Australia. [...]

Fields of interests

Paleontology; Biogeosciences; Geoecology/Natural Processes

Target groups

Professional/practitioner

Product category

Monograph

Due March 2012

2012. X, 450 p. 50 illus. in color. (Lecture Notes in Earth Sciences, Volume 135) Hardcover

► approx. \$179.00

ISBN 978-3-642-16410-1



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Due January 2012

2012. XVII, 183 p. 102 illus., 77 in color. (Springer Theses) Hardcover

► \$129.00

ISBN 978-3-642-25387-4



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J. P. Verdon, University of Bristol, UK

Microseismic Monitoring and Geomechanical Modelling of CO2 Storage in Subsurface Reservoirs

This thesis presents an impressive summary of the potential to use passive seismic methods to monitor the sequestration of anthropogenic CO₂ in geologic reservoirs. It brings together innovative research in two distinct areas – seismology and geomechanics – and involves both data analysis and numerical modelling.

Features

► Nominated for a Springer Theses Prize by University of Bristol, UK ► Using data from the Weyburn-Midale project, this thesis presents an impressive summary of the potential to use passive seismic methods to monitor the sequestration of anthropogenic CO₂ in geologic reservoirs ► The author received the 2010 Royal Astronomical Society Keith Runcorn Prize for best geophysics thesis in the UK

Contents

Introduction.- The Weyburn CO₂ injection project.- Inverting shear-wave splitting measurements for fracture properties.- A comparison of microseismic monitoring of fracture stimulation due to water versus CO₂ injection.- Geomechanical simulation of CO₂ injection.- Generating anisotropic seismic models based on geomechanical simulation.- Forward modelling of seismic properties.- Linking geomechanical modelling and microseismic observations at Weyburn.- Conclusions.- In Support of Carbon Capture and Storage.

Fields of interests

Geophysics/Geodesy; Geology; Monitoring/Environmental Analysis

Target groups

Research

Product category

Monograph