

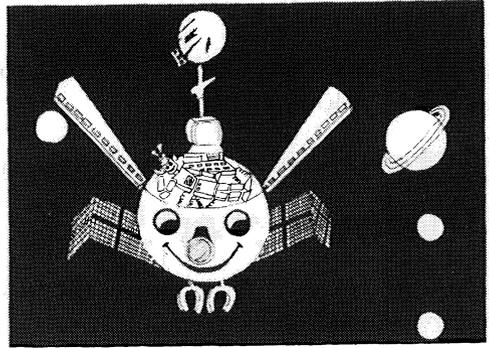
Topics in Geophysics

I. Palaz, S. Sengupta (Eds.)

Automated Pattern Analysis in Petroleum Exploration

1992. XV, 295 pp. 213 figs. Hardcover DM 154,-
ISBN 3-540-97468-7

Here is a state-of-the-art survey of artificial intelligence in modern exploration programs. Focussing on standard exploration procedures, the contributions examine the advantages and pitfalls of using these new techniques, and, in the process, provide new, more accurate and consistent methods for solving old problems. They show how expert systems can provide the integration of information that is essential in the petroleum industry when solving the complicated questions facing the modern petroleum geoscientist.



Future remote sensor – a cartoon sketch

Y. V. Riznichenko

Problems of Seismology

1992. XVIII, 445 pp. 129 figs. 23 tabs. Hardcover DM 309,-
ISBN 3-540-54230-2

These most significant papers by Y. V. Riznichenko are related to fundamental problems of seismology such as Source Seismology, Seismic Hazard, Seismotectonic Flow of Rock Masses, Geoacoustics and Structural Seismology. For the first time a complete overview of his work on seismology is available in English.

Jointly published by Springer-Verlag Berlin Heidelberg New York London Paris Tokyo Hong Kong Barcelona Budapest and MIR Publishers, Moscow, Russia

Distribution rights for the CIS, Iran, India and Eastern Europe: MIR Publishers, Moscow, Russia

P. Weimer, M. H. Link (Eds.)

Seismic Facies and Sedimentary Processes of Submarine Fans and Turbidite Systems

1991. XV, 447 pp. 337 figs. 20 tabs. (Frontiers in Sedimentary Geology) Hardcover DM 174,- ISBN 3-540-97469-5

Contents: Preface – Introduction. – Techniques and Topics in Turbidite Research. – Seismic Facies and Sedimentary Processes of Ancient Submarine Fans and Turbidite Systems. – Seismic Facies and Sedimentary Processes of Modern Submarine Fans and Turbidite Systems. – Appendix 1: Abstracts. – Index.

R. P. Gupta

Remote Sensing Geology

1991. XVI, 356 pp. 289 figs. 36 tabs. Hardcover DM 205,-
ISBN 3-540-52805-9

Remote Sensing Geology gives a full treatment of the subject by discussing remote sensing methods and applying them to geo-exploration.

The reader will find a wealth of information on:

– Various aspects of geological remote sensing, ranging from laboratory spectra of minerals and rocks, ground truth, to aerial and spaceborne remote sensing. – The integration of photogeology into remote sensing. – Remote sensing as a tool of geo-exploration. – A wide spectrum of geoscientific applications of remote sensing ranging from meso- to global scale.

The subject matter is introduced at a basic level serving students as an introductory text on remote sensing. The main part of the book will also be of value to active researchers.

D. Bahat

Tectonofractography

1991. XVIII, 354 pp. 197 figs. in 299 parts. Hardcover DM 309,-
ISBN 3-540-53281-1

This outstanding multidisciplinary study reviews the existence and behaviour of fractures (joints) and fracture surface morphology (fractography). The classification of characteristics will not only be useful for structural geologists, oil-, hydro-, and engineering geologists, but also for material sciences and environmental techniques.

Prices are subject to change without notice. All prices for books and journals include 7% VAT. In EC countries the local VAT is effective.

Springer-Verlag □ Heidelberg Platz 3, D-14197 Berlin, F. R. Germany □ 175 Fifth Ave., New York, NY 10010, USA □ 8 Alexandra Rd., London SW19 7JZ, England
□ 26, rue des Carmes, F-75005 Paris, France □ 37-3, Hongo 3-chome, Bunkyo-ku, Tokyo 113, Japan □ Room 701, Mirror Tower, 61 Mody Road, Tsimshatsui, Kowloon, Hong Kong
□ Avinguda Diagonal, 468-4^o C, E-08006 Barcelona, Spain □ Wesselényi u 28, H-1075 Budapest, Hungary



Springer

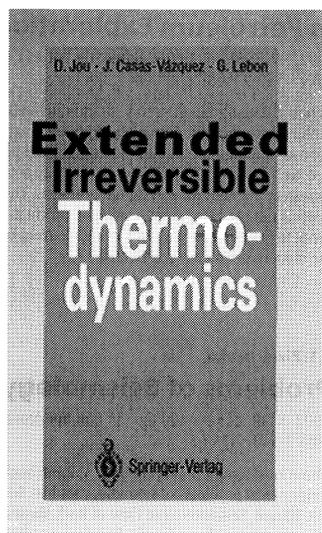
tm 959/MNT/E/1

A New Approach

D. Jou, J. Casas-Vazquez, University of Barcelona;
G. Lebon, University of Liège

Extended Irreversible Thermodynamics

1993. XII, 319 pp. 17 figs. Softcover DM 78,-
ISBN 3-540-55874-8



This is the first comprehensive book on a new thermodynamic theory that goes beyond the classical theory of irreversible processes. In contrast to the classical approach, the local equilibrium hypothesis is abandoned. The basic variables describing the system are no longer the equilibrium-conserved variables, but are complemented by non-equilibrium quantities taking the form of the flux of heat, the viscous pressure tensor, the flux of matter, the flux of electric current, etc. The statements behind extended thermodynamics are confirmed by the kinetic theory of gases and statistical mechanics.

The book covers a wide spectrum of applications such as hyperbolic heat conduction, rheological models, waves in fluids, generalized hydrodynamics, phase diagrams of solutions under shear, non-Fickian diffusion, electrical systems, and a relativistic formulation including some cosmological applications. It also contains a wide discussion of the foundations and scope of the most current theories of non-equilibrium thermodynamics.



Springer

Prices are subject to change without notice.

All prices for books and journals include 7% VAT. In EC countries the local VAT is effective.

rb.842/MNT/E/1

Springer-Verlag □ Heidelberger Platz 3, D-14197 Berlin, F. R. Germany □ 175 Fifth Ave., New York, NY 10010, USA □ 8 Alexandra Rd., London SW19 7JZ, England □ 26, rue des Carmes, F-75005 Paris, France □ 37-3, Hongo 3-chome, Bunkyo-ku, Tokyo 113, Japan □ Room 701, Mirror Tower, 61 Mody Road, Tsimshatsui, Kowloon, Hong Kong □ Avinguda Diagonal, 468-4^oC, E-08006 Barcelona, Spain □ Wesselényi u. 28, H-1075 Budapest, Hungary

Communications in Mathematical Physics

Copyright. Submission of a manuscript implies: that the work described has not been published before (except in the form of an abstract or as part of a published lecture, review, or thesis); that it is not under consideration for publication elsewhere; that its publication has been approved by all coauthors, if any, as well as by the responsible authorities at the institute where the work has been carried out, that, if and when the manuscript is accepted for publication, the authors agree to automatic transfer of the copyright to the publisher, and that the manuscript will not be published elsewhere in any language without the consent of the copyright holders.

All articles published in this journal are protected by copyright, which covers the exclusive rights to reproduce and distribute the article (e.g., as offprints), as well as all translation rights. No material published in this journal may be reproduced photographically or stored on microfilm, in electronic data bases, video disks, etc., without first obtaining written permission from the publisher.

The use of general descriptive names, trade names, trademarks, etc., in this publication, even if not specifically identified, does not imply that these names are not protected by the relevant laws and regulations

While the advice and information in this journal is believed to be true and accurate at the date of its going to press, neither the authors, the editors, nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein

Special regulations for photocopies in the USA. Photocopies may be made for personal or in-house use beyond the limitations stipulated under Section 107 or 108 of U.S. Copyright Law, provided a fee is paid. All fees should be paid to the Copyright Clearance Center, Inc., 21 Congress Street, Salem, MA 01970, USA, stating the ISSN 0010-3616, the volume, and the first and last page numbers of each article copied. The copyright owner's consent does not include copying for general distribution, promotion, new works, or resale. In these cases, specific written permission must first be obtained from the publisher

Authors should mark manuscripts according to the „Instructions to Authors.“ They should be aware that manuscripts which are not properly marked require additional time for publication. Manuscripts should be sent to:

Prof. H. Araki, Research Institute for Mathematical Sciences, Kyoto University, Kyoto, 606, Japan

Prof. D. Brydges, Department of Mathematics, University of Virginia, Charlottesville, VA 22903, USA

Prof. A. Connes, I.H.E.S., F-91440 Bures-sur-Yvette, France

Prof. R. Dijkgraaf, Department of Mathematics, University of Amsterdam, Plantage Muidergracht 24, NL-1018 TV Amsterdam, The Netherlands

Prof. J.-P. Eckmann, Département de Physique Théorique, Université de Genève, 32, Boulevard d'Ivroy, CH-1211 Genève 4, Switzerland

Prof. G. Felder, Mathematics Department, ETH-Zentrum, CH-8092 Zürich, Switzerland

Prof. M.E. Fisher, Institute for Physical Science and Technology, University of Maryland, College Park, MD 20742, USA

Prof. M. Herman, Centre de Mathématiques Pures, Ecole Polytechnique, F-91128 Palaiseau Cedex, France

Prof. A. Jaffe, Lyman Laboratory of Physics, Harvard University, Cambridge, MA 02138, USA

Prof. M. Jimbo, Department of Mathematics, Kyoto University, Kitashirakawa Oiwake-cho, Sakyo-ku, Kyoto 606, Japan

Prof. J. L. Lebowitz, Department of Mathematics, Rutgers University, New Brunswick, NJ 08903, USA

Prof. B. Simon, Department of Mathematics, California Institute of Technology, Pasadena, CA 91125, USA

Prof. Ya. G. Sinai, Department of Mathematics, Fine Hall, Princeton University, Princeton, NJ 08544-1000, USA

Prof. T. Spencer, School of Mathematics, Institute for Advanced Study, Princeton, NJ 08540, USA

Prof. S.-T. Yau, Department of Mathematics, Harvard University, 1 Oxford Street, Cambridge, MA 02138, USA

Mathematical methods with direct relevance to physics

Statistical physics, quantum field theory

Quantum physics and differential geometry

String theory, conformal field theory and related topics

Dynamical systems

Quantum field theory

Statistical physics

Classical dynamical systems

Chief Editor

Integrable systems and related topics

Nonequilibrium statistical mechanics

Schrödinger operators and atomic physics

Statistical physics and dynamical systems

Disordered systems

Relativity; geometry and physics

Subscription Information

ISSN 0010-3616

Vols 150-157 (3 issues each) will appear in 1993. **North America.** Recommended annual subscription rate. US \$ 3403.00, single issue price \$ 173.00 including carriage charges. Subscriptions are entered with prepayment only. Orders should be addressed to: Springer-Verlag New York Inc., Service Center Secaucus, 44 Hartz Way, Secaucus, NJ 07094, USA, Tel (201) 348-4033, Telex 023125994, Fax (201)348-4505. Members of the International Association of Mathematical Physics (IAMP) are entitled to receive the journal strictly for their own personal use at a special reduced rate. The orders must be placed through the IAMP. **All Other Countries.** Recommended annual subscription rate: DM 5104.00, plus carriage charges. [Germany, DM 78.32 incl. VAT, all other countries: DM 104.40] SAL or airmail charges are available upon request. SAL delivery is mandatory to Japan, India, and Australia/New Zealand. Airmail delivery to all other countries is available upon request. Volume price: DM 638.00, single issue price: DM 255.20 plus carriage charges. Orders for all countries except North America can either be placed with your bookseller or sent directly to: Springer-Verlag, Postfach 311 340, D-10643 Berlin, Germany, Tel. (030)8207-1, Telex 0183319, Fax (0)30/8207448. **Changes of Address.** Allow six weeks for all changes to become effective. All communications should include both old and new addresses (with Postal Codes) and should be accompanied by a mailing label from a recent issue. According to § 4 Sect. 3 of the German Postal Services Data Protection Regulations, if a subscriber's address changes the German Federal Post Office can inform the publisher of the new address even if the subscriber has not submitted a formal application for mail to be forwarded. Subscribers not in agreement with this procedure may send a written complaint to Springer-Verlag's Berlin office within 14 days of publication of this issue. **Back Volumes.** Prices are available on request. **Microform:** Microform editions are available from: University Microfilms International, 300 N Zeeb Road, Ann Arbor, MI 48106, USA.

Production

Journal Production Department I, Springer-Verlag, Monika Ebert, Postfach 105280, D-69042 Heidelberg, Germany.

Address for courier, express and registered mail: Tiergartenstrasse 17, D-69121 Heidelberg, Germany, Tel. (0) 62 21/4 87-431, Telex 0461723, Fax (0)6221-487624

Communications in **Mathematical Physics**

Chief Editor A. Jaffe, Cambridge, MA

Editorial Board H. Araki, Kyoto
D. Brydges, Charlottesville, VA
A. Connes, Bures-sur-Yvette
R. Dijkgraaf, Amsterdam
J.-P. Eckmann, Genève
G. Felder, Zürich
M. E. Fisher, College Park, MD
M. Herman, Palaiseau
M. Jimbo, Kyoto
J. L. Lebowitz, New Brunswick, NJ
B. Simon, Pasadena, CA
Ya. G. Sinai, Princeton, NJ
T. Spencer, Princeton, NJ
S.-T. Yau, Cambridge, MA

Advisory Board M. F. Atiyah, Oxford
L. Faddeev, St. Petersburg
F. Hirzebruch, Bonn
R. Schrieffer, Santa Barbara, CA
I. Singer, Cambridge, MA
C. N. Yang, Stony Brook, NY

Responsible for Advertisements

Springer-Verlag
Printers
Printed in Germany

E. Lückermann, M. Stresow, Heidelberger Platz 3, D-14197 Berlin, Germany
Telephone: (030) 8207-1, Telex 01-85411, Fax (0)30/820 7300
Berlin Heidelberg New York Tokyo Hong Kong Barcelona Budapest
Brühlsche Universitätsdruckerei, Giessen
© Springer-Verlag Berlin Heidelberg 1993
Springer-Verlag GmbH & Co KG, D-14197 Berlin, Germany