

Short Book Reviews



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Editor Dr. A.M. Herzberg

REVIEWS

SYMMETRY AND THE MONSTER. One of the Greatest
Quests of Mathematics.
M. Ronan.
Oxford University Press, 2006, pp. vii + 255.

Contents:

Prologue

1. Theaetetus's icosahedron
2. Galois: Death of a genius
3. Irrational solutions
4. Groups
5. Sophus Lie
6. Lie groups and physics
7. Going finite
8. After the war
9. The man from Uccle
10. The big theorem
11. Pandora's box
12. The leech lattice
13. Fischer's theorem
14. The atlas
15. A monstrous mystery
16. Construction
17. Moonshine

Notes

APPENDIX 1: The Golden Section

APPENDIX 2: The Witt Design

APPENDIX 3: The Leech Lattice

APPENDIX 4: The 26 Exceptions

Readership: Students and lay people interested in
important mathematical concepts
presented in a nontechnical manner

This book describes the historical development leading up to the discovery of the Monster - 'the most exceptional finite symmetry group in mathematics'. It interweaves personal narratives about the lives of those responsible for the several hundred year history culminating in this discovery, with the mathematical ideas and concepts. Because of the importance of group theory in modern mathematics, physics, and other areas, an impressive panoply of eminent names appears. The human stories are interesting, albeit brief, and the book nicely conveys the flavour and excitement of mathematical research, and the fact that mathematicians are not of a uniform kind, but come in all shapes, sizes, attitudes and opinions. It assumes essentially no prior knowledge of mathematics, even going so far as to present a footnote showing how to solve a quadratic equation, and to describe Cartesian coordinate systems.

Imperial College of Science,
Technology and Medicine
London, U.K.

JAMES JOSEPH SYLVESTER, JEWISH
MATHEMATICIAN IN A VICTORIAN WORLD.
K.H. Parshall.
Baltimore: Johns Hopkins University Press,
2006, pp. xvii + 461, £46.50.

Contents:

Introduction

1. Born to "the Faith in which the Founder of Christianity was Educated"
2. A price of dissent
3. The hollow walls of academe
4. Actuary by day ... Mathematician by night
5. Into the invariant-theoretic unknown
6. A new beginning
7. At war with the military
8. The uneasy years
9. Exploring familiar ground on unfamiliar territory
10. Tackling new challenges in a home away from home
11. A bittersweet victory
12. The final transition
13. Epilogue

Readership: Mathematicians, scientists, historians of
science

James Joseph Sylvester (1814-1897) was born in London as James Joseph and the surname "Sylvester" was adopted from his elder brother Sylvester Joseph. It seems that the brothers "wanted an unequivocally non-Jewish surname as their calling card in life". This change in name, minor though it be, signifies much more in the tempestuous life of Sylvester. As the author writes, "Anglo-Jewry did not then exist as a well-defined social and cultural category. Essential tensions were nevertheless in evidence that would soon effect key changes."

This comprehensive biography is a sequel to the author's earlier work, *James Joseph Sylvester: Life and Work in Letters*. "The book aims to tell, for the first time, the complex story of Sylvester's life by situating that life as fully as possible within the political, religious, mathematical and social currents of the nineteenth century England. It aims to demythologize the man by placing him in his milieu at the same time that it demystifies his mathematics by revealing it as a very human endeavor. It aims to show how the man lived his life, what choices he made and why, how the world in which he lived affected him, and how he affected that world."

This fascinating biography traces the early days of Sylvester in Cambridge, when he came second in the mathematical tripos examination surpassing George Green, of "Green's theorem" fame. However, he was unable to graduate since being of Jewish faith, he could not sign up to the Thirty-Nine Articles of the Church of England which was a necessary condition for graduation. Nevertheless, he was able to secure a position at the University

D.J. Hand

of London, one of the few places which did not bar his entry based on his religion. But this position was in physics and he was more a mathematician. So he emigrated to the United States in the hope of finding a position in a mathematics department. It appears that at this time, he became romantically involved with a "Miss Marston" who, when he proposed marriage, turned him down, again on the grounds of religion! Dejected, Sylvester returned to England and took up an actuarial position by day and gave mathematical tuition by night. Apparently, one of his pupils was Florence Nightingale.

A turning point seems to have come in 1877, when Sylvester accepted a position at Johns Hopkins University where he founded the now famous *American Journal of Mathematics*. This was the first mathematical journal published in the United States. At Johns Hopkins, he could teach and research unfettered by the religion bias he encountered before. This period can be described as his most productive and Sylvester is credited with developing matrix theory, theory of equations, partition theory and some early foundational work in algebra at that time.

What emerges in this biography is Sylvester, the man, his encounters with the social, cultural and political milieu. Its extensive research into the vast archival sources gives the reader a detailed view of the Jewish mathematician living in the Victorian era, as the appropriate subtitle suggests. Both mathematicians and historians of mathematics would benefit from this book. It is well-written and engaging.

Queen's University
Kingston, Canada

M.R. Murty

GENERATING FUNCTIONOLOGY, 3rd edition.

H.S. Wilf.
Wellesley, Massachusetts:
A.K. Peters, 2006, pp. x 245,
US\$39.00.

Contents:

1. Introductory ideas and examples
2. Series
3. Cards, decks, and hands: The exponential formula
4. Applications of generating functions
5. Analytic and asymptotic methods

Appendix: Using Maple and Mathematica

Readership: Mathematicians, scientists

The title of this book refers to the general method of associating a generating function to study a sequence of numbers, often defined by combinatorial constraints. Depending on the context, the generating function could be a power series, an exponential power series, a Dirichlet series or something more exotic. For instance, if the sequence is given by a recurrence relation, the power series associated with it turns out to be a rational function. One can then determine the singularities of this function which in turn can be used to give an explicit expression for the n -th term of the sequence.

Wilf's book is very well-written and easy to read by any serious mathematics student. Scientists in other disciplines often encounter the need to study sequences that naturally arise in their own discipline. The book is well-suited to them also. Just to give an indication of the friendly style of the book, I quote the opening line: "A generating function is a clothesline on which we hang up a sequence of numbers for display." For many who consult the "On-line Encyclopedia of Integer Sequences", see

www.research.att.com/~njas/sequences/,
this book is a welcome guide.

The book is also suitable for a senior level course in combinatorics and is filled with numerous exercises. Unfortunately, the solutions are also included and so the

instructor may have to create some new exercises for the class.

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M.R. Murty

BAYESIAN NETWORKS AND PROBABILISTIC INFERENCE IN FORENSIC SCIENCE.

F. Taroni, C. Aitken, P. Garbolino and A. Biedermann.
Chichester, U.K.: Wiley, 2006, pp. xviii + 354, £55.00.

Contents:

1. The logic of uncertainty
2. The logic of Bayesian networks
3. Evaluation of scientific evidence
4. Bayesian networks for evaluating scientific evidence
5. DNA evidence
6. Transfer evidence
7. Aspects of the combination of evidence
8. Pre-assessment
9. Qualitative and sensitivity analysis
10. Continuous networks
11. Further applications

Readership: Forensic scientists, applied statisticians working in evidence evaluation, graduate students in these areas. Scientists, lawyers, and others interested in the evaluation of forensic evidence and/or Bayesian networks

This book eloquently argues the case for the use of Bayesian networks in forensic science. It uses the HUGIN system to illustrate, but, of course, alternatives could be used. It should be highly accessible by anyone with a fairly basic grasp of probability and a willingness to work through the many illustrations. It is clearly written, and nicely produced.

Statistics is, of course, the primary discipline concerned with the weighing and analysis of evidence. In recent years one has witnessed a rise in awareness of the importance of bringing this expertise to bear in courts of law, which are also concerned with weighing evidence, though there is still some way to go. This book will significantly advance that process. More generally, it also provides one of the best introductions to the theory and principles of Bayesian belief networks that I have seen, and could be used for a course in that, regardless of its particular application to forensic science.

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D.J. Hand

HANDBOOK OF UNIVARIATE AND MULTIVARIATE DATA ANALYSIS AND INTERPRETATION WITH SPSS.

R. Ho.
Boca Raton, Florida: Chapman and Hall/
CRC Press, 2006, pp. 406, US\$89.95/£49.99.

Contents:

1. Inferential statistics and test selection
2. Introduction to SPSS
3. Multiple response
4. T-test for independent groups
5. Paired-samples t-test
6. One-way analysis of variance, with post hoc comparisons
7. Factorial analysis of variance
8. General linear model (GLM) multivariate analysis
9. General linear model: repeated measures analysis

10. Correlation
 11. Linear regression
 12. Factor analysis
 13. Reliability
 14. Multiple regression
 15. Structural equation modelling
 16. Nonparametric tests
- APPENDIX: Summary of SPSS Syntax Files

Readership: Students of statistics and applied researchers
in social science and psychology

This book offers an easy-to-read coverage of the uses and interpretation of basic statistical methods as applied to experimental data. The methods are presented using the software package SPSS (Statistical Product and Service Solutions, formerly Statistical Package for the Social Sciences) for Windows and the text proceeds through the analysis of a variety of sets of data (each accessible from the Web), interspersed throughout the text with illustrative SPSS code (also available from the Web). The main features of the package are presented and illustrated with examples using both the Windows method (point-and-click) and the traditional syntax method.

The mathematical prerequisites for using this book are minimal (appreciation of mathematical formulae and graphs) and calculus is not required. Some familiarity with using a computer is necessary in order to gain the most benefit from the text, and some previous experience of using a statistical software package would be advantageous. The text is suitable for private study.

CEFAS Lowestoft Laboratory
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C.M. O'Brien

MODELS FOR DISCRETE DATA, Revised Edition.

D. Zelterman.
Oxford University Press, 2006,
pp. x + 285, £50.00.

Contents:

1. Introduction
2. Sampling distributions
3. Logistic regression
4. Log-linear models
5. Coordinate-free models
6. Additional topics

APPENDIX A: Power for the Chi-Squared Tests
APPENDIX B: A FORTRAN Program for Exact Tests in
Tables
APPENDIX C: S-plus Programs for the Extended
Hypergeometric Distribution

Readership: Statisticians, graduate students of statistics,
numerate biomedical or sociological
research workers

The author hopes this book will be used as a text to accompany a one semester master's graduate level course but it is also relevant to students following a statistics or biostatistics graduate degree. The book contains a large number of practical examples which have a health/medical bias.

The reader is expected to know about topics in elementary statistics such as sample means and variances, the Pearson chi-squared and statistical distributions such as the binomial and Poisson and a basic knowledge of SAS as a minimum. It is desirable for students to be familiar with matrix multiplication, maximum likelihood estimation, sufficient statistics, moment generating functions and hypothesis testing to be able to gain maximum benefit from the text. The reader is also encouraged to attempt all of the exercises that are included at the end of each chapter. At the end of the book there are hints and some solutions to these exercises.

The previous edition [Short Book Reviews, Vol. 19, p. 23] of this text has been used with many students and as a result this revised edition contains many more exercises. There are more applied exercises requiring computer solutions, usually in SAS. The author has also included new sets of data; most frequently from the health and medical sector, and previously unpublished data from a study of Tourette's syndrome in children. A computer file containing programs and sets of data is available by contacting the author.

The author has a wealth of experience in this area and this is demonstrated throughout the text with relevant poignant examples. This revised edition provides a sound introduction to the subject for graduate students and for practitioners needing a review of the methodology. An excellent practical book to be used in conjunction with relevant courses or to be used for reference and updating as required.

London South Bank University
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S. Starkings

ESTIMATION OF DEPENDENCES BASED ON

EMPIRICAL DATA. Reprint of 1982 edition.
Empirical Inference Science. Afterword of 2006.
V. Vapnik.
New York: Springer-Verlag, 2006,
pp. xviii + 505, US\$69.95.
[Original 1982, Short Book Reviews, Vol. 3, p. 3]

Contents:

1. The problem of estimating dependences from empirical data
Appendix to Chapter 1. Methods for Solving Ill-posed Problems
2. Methods of expected risk minimization
3. Methods of parametric statistics for the pattern recognition problem
4. Methods of parametric statistics for the problem of regression estimation
5. Estimation of regression parameters
6. A method of minimizing empirical risk for the problem of pattern recognition
Appendix to Chapter 6. Theory of Uniform Convergence of Frequencies to Probabilities: Sufficient Conditions
7. A method of minimizing empirical risk for the problem of regression estimation
Appendix to Chapter 7. Theory of Uniform Convergence of Means to their Mathematical Expectations: Necessary and Sufficient Conditions
8. The method of structural empirical minimization of risk
9. Solution of ill-posed problems. Interpretation of measurements using the method of structural risk minimization
Appendix to Chapter 9. Statistical Theory of Regularization
10. Estimation of functional values at given points
Appendix to Chapter 10. Taxonomy Problems

Postscript

Addendum I. Algorithms for pattern recognition
Addendum II. Algorithms for estimating nonindicator functions

Bibliographical Remarks

Empirical Inference Science. Afterword of 2006

1. Realism and Instrumentalism: Classical statistics and VC theory
2. Falsifiability and parsimony: VC dimension and the number of entities (1980-2000)
3. Noninductive methods of inference: Direct inference instead of generalization (2000-...)
4. The big picture

Readership: Students and research workers in statistics

The first edition of this book was published in 1982, it was a translation by S. Kotz of the 1979 Russian edition. I reviewed that edition [[Short Book Reviews](#), Vol. 3, p. 3]. This first edition is included in this new volume as it was, i.e. it is reprinted. The author has now added Chapters 1, 2, 3, as listed in the contents under "Empirical Inference Science, Afterword of 2006". These chapters were written as the author says: "to update the technical results presented [in the previous volume] and to describe a general picture of how the new ideas developed over these years." The fourth chapter called "The Big Picture" was written for his students and his students' students to tell "what is going on in the development of this science and in closely related branches of science in general (not only about some technical details)."

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FUNCTIONAL APPROACH TO OPTIMAL
EXPERIMENTAL DESIGN.

V.B. Melas.

New York: Springer-Verlag, 2006,
pp. ix + 333, US\$59.95.

Contents:

1. Fundamentals of the optimal experimental design
2. The functional approach
3. Polynomial models
4. Trigonometrical models
5. D-optimal designs for rational models
6. D-optimal designs for exponential models
7. E- and c-optimal designs
8. The Monod model

Readership: Statisticians, graduate students interested in optimal design

The book presents a non-traditional approach to optimal design of experiments. The approach, named "functional" by the author and developed by him and other researchers over the last twenty-five years or so, relies on the Implicit Function Theorem which allows one to represent support points of locally optimal designs as functions of parameter values and then use Taylor series techniques. The book starts with a survey of general results of optimal design (various criteria of optimality, the generalized equivalence theorem, locally optimal designs for nonlinear models, numerical algorithms). Then the author illustrates the application of the functional approach to some classical models (polynomial, trigonometric, exponential). The last chapter of the monograph is devoted to the Monod model which is widely used in biological applications.

GlaxoSmithKline
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S. Leonov

DESIGN AND MODELING FOR COMPUTER
EXPERIMENTS.

K.-T. Fang, R. Li and A. Sudjanto.

Boca Raton, Florida: Chapman and Hall/
CRC Press, 2006, pp. xii + 290.

Contents:

PART I: An Overview

1. Introduction

PART II: Design of Computer Experiments

2. Latin hypercube sampling and its modifications
3. Uniform experimental design
4. Optimization in construction of designs for computer experiments

PART III: Modeling for Computer Experiments

5. Metamodeling
6. Model interpretation
7. Functional response

Readership: Statisticians

This book is a very close sibling of *The Design and Analysis of Computer Experiments* Th.J. Santner, B.J. Williams and W.I. Notz published by Springer in 2003 [[Short Book Reviews](#), Vol. 24, p. 27]. The authors use simple probabilistic models to approximate computationally demanding deterministic models. I did not find any strong motivation why this type of approximation can successfully compete with the methods based on classical approximation theory. The use of the term "metamodeling" is rather confusing. The polynomial, splines, Kriging approximations, etc., which are used as simplified descriptions of more complex models, should be called "secondary" models, not metamodels.

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V.V. Fedorov

INTRODUCTION TO CODING THEORY.

R.M. Roth.

Cambridge University Press, 2006,
pp. xi + 566, £40.00; US\$75.00.

Contents:

1. Introduction
2. Linear codes
3. Introduction to finite fields
4. Bounds on the parameters of codes
5. Reed-Solomon and related codes
6. Decoding of Reed-Solomon codes
7. Structure of finite fields
8. Cyclic codes
9. List decoding of Reed-Solomon codes
10. Codes in the Lee metric
11. MDS codes
12. Concatenated codes
13. Graph codes
14. Trellis and convolutional codes

APPENDIX: Basics in Modern Algebra

Readership: Computer scientists, electrical engineers, mathematicians

Although this book is titled *Introduction to Coding Theory*, it contains topics beyond those normally found in an introductory text on this subject. It is aimed at upper undergraduate and postgraduate level.

It is assumed the reader has a good working knowledge of linear algebra, probability and discrete mathematics, but there are two separate chapters on finite fields which play such an important part in this subject. The first of these lays the framework for generalized Reed-Solomon codes which are commonly used in magnetic and optical storage media. Further material on finite fields, including minimal polynomials and cyclotomic cosets, is introduced later in order to discuss cyclic codes.

The mathematical style of this book is clear, concise and scholarly with a pleasing layout. There are numerous exercises, many with hints and many introducing further new concepts.

Altogether this is an excellent book covering a wide range of topics in this area, and including an extensive bibliography.

Imperial College of Science,
Technology and Medicine
London, U.K.

L.V. White

RESPONSE SURFACE METHODOLOGY AND RELATED TOPICS.

A.I. Khuri (Ed.),
Singapore: World Scientific,
2006, pp. xii + 457.

Contents:

1. Two-level factorial and fractional factorial designs in blocks of size two. Part 2,
by Y.J. Yang and N.R. Draper
2. Response surface experiments on processes with high variation,
by G. Gilmour and L.A. Trinca
3. Random run order, randomization and inadvertent split-plots in response surface experiments,
by J. Ganju and J.M. Lucas
4. Statistical inference for response surface optima,
by D.K.J. Lin and J.J. Peterson
5. A search method for the exploration of new regions in robust parameter design,
by G. Miro-Quesada and E. del Castillo
6. Response surface approaches to robust parameter design,
by T.J. Robinson and S.S. Wulff
7. Response surface methods and their application in the treatment of cancer with drug combinations: Some reflections,
by K.S. Dawson, T.J. Eller and W.H. Carter, Jr.
8. Generalized linear models and response transformation,
by A.C. Atkinson
9. GLM Designs: The dependence on unknown parameters dilemma,
by A.I. Khuri and S. Mukhopadhyay
10. Design for a trinomial response to dose,
by S.K. Fan and K. Chaloner
11. Evaluating the performance of non-standard designs: The San Cristobal design,
by L.M. Haines
12. 50 Years of mixture experiment research: 1955-2004,
by G.F. Piepel
13. Graphical methods for comparing response surface designs for experiments with mixture components,
by H.B. Goldfarb and D.C. Montgomery
14. Graphical methods for assessing the prediction capability of response surface designs,
by J.J. Borkowski
15. Using fraction of design space plots for informative comparisons between designs,
by C.M. Anderson-Cook and A. Ozol-Godfrey
16. Concepts of slope-rotatability for second order response surface designs,
by S.H. Park
17. Design of experiments for estimating differences between responses and slopes of the response,
by S. Huda

Readership: Design of experiments aficionados, especially those in the response surface area

The seventeen papers cover a wide range of topics, all connected to response surface modeling. This is a useful collection to have on hand, or in the library.

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N.R. Draper

SCREENING. METHODS FOR EXPERIMENTATION IN INDUSTRY, DRUG DISCOVERY, AND GENETICS.

A.M. Dean and S.M. Lewis, Eds.
New York: Springer-Verlag, 2006,
pp. xv + 332, US\$77.90.

Contents:

1. An overview of industrial screening experiments,
by D.C. Montgomery and C.L. Jennings

2. Screening experiments for dispersion effects,
by D. Bursztyn and D.M. Steinberg
3. Pooling experiments for blood screening and drug discovery,
by J.M. Hughes-Oliver
4. Pharmaceutical drug discovery: Designing the blockbuster drug,
by D.J. Cummins
5. Design and analysis of screening experiments with microarrays,
by P. Sebastiani, J. Jeneralczuk and M.F. Ramoni
6. Screening for differential gene expressions from microarray data,
by J.C. Hsu, J.Y. Chang and T. Wang
7. Projection properties of factorial designs for factor screening,
by C.-S. Cheng
8. Factor screening *via* supersaturated designs,
by S.G. Gilmour
9. An overview of group factor screening,
by M.D. Morris
10. Screening designs for model selection,
by W. Li
11. Prior distributions for Bayesian analysis of screening experiments,
by H. Chipman
12. Analysis of orthogonal saturated designs,
by D.T. Voss and W. Wang
13. Screening for the important factors in large discrete-event simulation models: Sequential bifurcation and its applications,
by J.P.C. Kleijnen, B. Bettonvil and F. Persson
14. Screening the input variables to a computer model *via* analysis of variance and visualization,
by M. Schonlau and W.J. Welch

Readership: Individuals who "sift through a very large number of factors, genes or compounds, in order to discover the few that influence a measured response"

This is an excellent aggregation of fourteen papers about screening, covering general areas. It includes recent work and provides first class summaries of various topics. The fourteen chapters have about twenty-two pages of references between them, helping the reader to delve further as needed. It is definitely an excellent library selection; some may prefer to have it even closer at hand. The cover art comes from p. 201 and is not a chapter summary!

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N.R. Draper

DOSE FINDING IN DRUG DEVELOPMENT.

N. Ting (Ed.).
New York: Springer-Verlag, 2006,
pp. xiv + 248, US\$79.95.

Contents:

1. Introduction and new drug development process,
by N. Ting
2. Dose-finding based on preclinical studies,
by D. Salsburg
3. Dose-finding studies in Phase I and estimation of maximally tolerated dose,
by M. Modi
4. Dose-finding in oncology — nonparametric methods,
by A. Ivanova
5. Dose-finding in oncology — parametric methods,
by M. Tighiouart and A. Rogatko

6. Dose response: Pharmacokinetic-pharmacodynamic approach,
by N. Holford
7. General considerations in dose-response study designs,
by N. Ting
8. Clinical trial simulation — A case study incorporating efficacy and tolerability dose response,
by W. Ewy, P. Lockwood and C. Bramson
9. Analysis of dose-response studies — E_{\max} Model,
by J. MacDougall
10. Analysis of dose-response studies — Modeling approaches,
by J. Pinheiro, F. Bretz, and M. Branson
11. Multiple comparison procedures in dose response studies,
by A.C. Tamhane and B.R. Logan
12. Partitioning tests in dose-response studies with binary outcomes,
by X. Ling, J. Hsu and N. Ting
13. Analysis of dose-response relationship based on categorical outcomes,
by C. Chuang-Stein and Z. Li
14. Power and sample size for dose-response studies,
by M. Chang and S.C. Chow

Readership: Statisticians and biostatisticians seeking an overview of the field of dose response studies, especially in the medical and regulatory contexts of clinical trials

This book is a collection of chapters contributed by different authors, each addressing a different aspect of the important problem of how to identify appropriate doses of medication during the drug development process — mainly in clinical trials from Phase I through Phase III. Most of the chapters are broad surveys of the issues involved in each subtopic. Most also assume prior statistical maturity of the reader. Except for the final chapter on sample size, the discussion is more conceptual than mathematical.

Consequently the most appropriate audience is statisticians and biostatisticians who desire an overview of the medical and regulatory contexts of the design and analysis of dose response studies as well as a digest of the field. Other readers may also benefit, for example clinical scientists, pharmacologists, and regulatory specialists, but most of the chapters imply prior knowledge of underlying statistical concepts that are not directly developed in the book. Most of the chapters provide many references where the reader can pursue further detail.

On the whole the individual chapters are well written, and the book overall is a nice reference from which to begin.

Brookfield, U.S.A.

C.A. Fung

BIOEQUIVALENCE AND STATISTICS IN CLINICAL PHARMACOLOGY.

S. Patterson and B. Jones.

Boca Raton, Florida: Chapman and Hall/
CRC Press, 2006, pp. xxi + 374, US\$89.95.

Contents:

1. Drug development and clinical pharmacology
2. History and regulation of bioequivalence
3. Testing for average bioequivalence
4. BE studies with more than two periods
5. Dealing with unexpected BE challenges
6. The future and recent past of BE testing
7. Clinical pharmacology safety studies
8. QTc
9. Clinical pharmacology efficacy studies
10. Population pharmacokinetics
11. Epilogue

Readership: Students, practitioners and researchers of bioavailability and bioequivalence studies

This book covers the statistical tools used in the assessment of bioequivalence and describes the use of statistics in clinical pharmacology studies of safety, QTc prolongation, efficacy, and population pharmacokinetics. The authors provide a historical perspective on the evolution of bioequivalence testing methods in the context of regulatory policies and public debates on these issues. Detailed description of current statistical concepts, methodology, and underlying assumptions of the design and analysis of bioavailability and bioequivalence studies are provided and exemplified using real data.

GlaxoSmithKline
Collegeville, U.S.A.

V. Dragalin

MODELS FOR DISCRETE LONGITUDINAL DATA.

G. Molenberghs and G. Verbeke.
New York: Springer-Verlag, 2005,
pp. xxii + 683, US\$89.95.

Contents:

PART I: Introductory Material

1. Introduction
2. Motivating studies
3. Generalized linear models
4. Linear mixed models for Gaussian longitudinal data
5. Model families

PART II: Marginal Models

6. The strength of marginal models
7. Likelihood-based marginal models
8. Generalized estimating equations
9. Pseudo-likelihood
10. Fitting marginal models with SAS

PART III: Conditional Models

11. Conditional models
12. Pseudo-likelihood

PART IV: Subject-Specific Models

13. From subject-specific to random-effects models
14. The generalized linear mixed model (GLMM)
15. Fitting generalized linear mixed Models with SAS
16. Marginal *versus* random-effects models

PART V: Case Studies and Extensions

17. The analgesic trials
18. Ordinal data
19. The epilepsy data
20. Non-linear models
21. Pseudo-likelihood for a hierarchical model
22. Random-effects models with serial correlation
23. Non-Gaussian random effects
24. Joint continuous and discrete responses
25. High-dimensional joint models

PART VI: Missing Data

26. Missing data concepts
27. Simple methods, direct likelihood, and WGEE
28. Multiple imputation and the EM algorithm
29. Selection models
30. Pattern-mixture models
31. Sensitivity analysis
32. Incomplete data and SAS

Readership: Statisticians, especially those working in the pharmaceutical industry, experimental scientists, post-graduate students of statistics

This book complements Verbeke and Molenberghs (2000), which focused on models based on the multivariate normal distribution. As the practical illustrations in the current book demonstrate, many real problems are far more complex in a variety of ways. This book covers the alternative models and approaches in a methodical and accessible manner. The emphasis in the book is on presenting methods for solving practical problems, and the authors succeed admirably in this. Motivation is provided

by the wide-ranging and interesting examples in Chapter 2. These examples recur throughout the book, and new sets of data are also introduced as the book progresses. The material on how to use SAS to perform analyses is invaluable. However the book is not devoted to SAS alone, and, for instance, there are illustrations using MLwin and MIXOR. The material is clearly presented, and this undoubtedly reflects the experience derived from the many international workshops and courses that the authors have given on the subject matter. To take just two examples, Chapter 14 deals clearly with GLMMs, and covers the standard Bayesian and classical approaches, while Section VI is comprehensive in its treatment of the taxonomy of missing longitudinal data, and in ways of dealing with such missing data. The importance of this work is clear from the special issue of the *Journal of the Royal Statistical Society* (2006, Vol 169, Part 3), which is devoted to *Attrition and Non-response*. The research contributions of the authors of this book to these areas are evident in the papers of that issue. This book is very welcome, and will undoubtedly prove to be useful and influential.

Verbeke, G. and Molenberghs, G. (2000) *Linear Mixed Models for Longitudinal Data*. New York: Springer-Verlag.

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B.J.T. Morgan

EXTENDING THE LINEAR MODEL WITH R:
GENERALIZED LINEAR, MIXED EFFECTS AND
NONPARAMETRIC REGRESSION MODELS.

J.J. Faraway.
Boca Raton, Florida: Chapman
and Hall/CRC Press,
2006, pp. v + 301,
US\$79.95.

Contents:

1. Introduction
2. Binomial data
3. Count regression
4. Contingency tables
5. Multinomial data
6. Generalised linear models
7. Other GLMs
8. Random effects
9. Repeated measures and longitudinal data
10. Mixed effect models for nonnormal responses
11. Nonparametric regression
12. Additive models
13. Trees
14. Neural networks

Readership: Graduate students in statistics, applied workers, biostatisticians

This book shows how the many variations that have been developed on the theme of the linear model have been implemented in the R software package. The R package, which has become somewhat ubiquitous in academic departments, is designed as part of the GNU project as freeware similar in appearance to S and hence S-plus. Due to its open design concept there have been very many different packages in R, written by many different groups of researchers, which implement both standard methodology and more cutting edge material. This volume does an excellent job of documenting the use, and existence, of these packages in the context of modern linear modelling using many data based examples. It is not however designed as an introductory text, neither for R or the basics of linear modelling but is written for those with some experience in both areas, and as such is a valuable contribution.

University of Waterloo
Waterloo, Canada

P. Marriott

ROBUST STATISTICAL METHODS WITH R.

J. Jureckova and J. Picek.
Boca Raton, Florida: Chapman
and Hall/CRC Press, 2006,
pp. xi + 197, \$79.95.

Contents:

1. Introduction
2. Mathematical tools of robustness
3. Basic characteristics of robustness
4. Robust estimators of real parameters
5. Robust estimators in linear model
6. Multivariate location model
7. Some large sample properties of robust procedures
8. Some goodness-of-fit tests
9. Appendix: R system

Readership: Graduate or final year students in statistics

This book follows a mathematical, but still readable, path in exploring the key ideas behind the theory of robust statistical methods. It explores a wide range of robust methods, including differentiable statistical functions, distance of measures, influence functions, and asymptotic distributions. The mathematical approach is supplemented with code, written in the package R, which illustrates the ideas behind the theory, and the referenced R code can be downloaded from the book's website. The book is clearly written and might form the theoretical foundation of a modern robustness course.

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P. Marriott

GENERALIZED ADDITIVE MODELS - AN
INTRODUCTION WITH R.

S.N. Wood.
Boca Raton, Florida: Chapman and Hall/
CRC Press, 2006, pp. xvii + 391,
US\$79.95/£39.99.

Contents:

1. Linear models
2. Generalized linear models
3. Introducing GAMs
4. Some GAM theory
5. GAMs in practice: mgcv
6. Mixed models and GAMMs

APPENDIX A: Some Matrix Algebra
APPENDIX B: Solutions to Exercises

Readership: Readers who wish to work through generalized linear models into generalized additive models, using R as their computing package

To get the most from this book one must use the R computing system, available on the internet. This is either a positive or negative depending on the reader's feelings and capabilities.

Before putting that issue aside, this book is really excellent. It is a pleasure to read, is extremely clear, and progresses smoothly through topics of increasing complexity. The table of contents is very detailed, making it easy to find topics directly; only the chapter titles are given here. The book is highly recommended.

University of Wisconsin
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N.R. Draper

LATENT CURVE MODELS.

K.A. Bollen and P.J. Curran.
Chichester, U.K.: Wiley, 2006,
pp. xii + 285, £55.95.

Contents:

1. Introduction
2. Unconditional latent curve model
3. Missing data and alternative metrics of time
4. Nonlinear trajectories and the coding of time
5. Conditional latent curve models
6. The analysis of groups
7. Multivariate latent curve models
8. Extensions of latent curve models

Readership: Researchers and graduate students

This book formulates traditional (multilevel) repeated measures models (individuals at level 2 and measurement occasions at level 1) in terms of structural equation modelling (SEM) models using standard notation and diagrams. Polynomial and multivariate models are described with and without covariate terms and a very brief reference to true nonlinear models (not simply polynomial representations) can be found in Chapter 4. Under the topic of multivariate latent curve models, linear first-order autoregressive dependencies are introduced among the level 1 random effects. In addition to the standard model for grouping factors, Chapter 6 has a brief section on mixture models where separate parameters are assumed for each different group where group membership is unknown. Categorical responses using a threshold modelling approach are dealt with in the final chapter which also discusses the case where the responses and covariates are treated as latent variables with associated multiple indicators.

The book will appeal to researchers and advanced students familiar with SEMs. Whether it provides an appropriate general introduction to repeated measures models, however, is open to question.

In many ways, the multilevel approach first clearly articulated by Laird and Ware (1982), provides a more natural characterization for repeated measures data. This approach now has a large literature that deals with topics hardly touched upon in the present book. These include time series models that incorporate random growth terms with general covariance structures that are functions of time and nonlinear response functions as well as Bayesian models using MCMC estimation. The most serious omission from this book, however, is consideration of data where each individual may have a completely unique set of time points. This case is covered only in passing (Section 3.2.5) yet in practice it is extremely common. Multilevel models (mentioned briefly in Section 2.6) take this case as the starting point, leading to general models of which most of those described in this book are just special cases. Multilevel models easily incorporate further levels of nesting and crossing of factors and recent work has begun to extend them to handle the repeated latent variable models discussed in the final chapter.

University of Bristol
Bristol, U.K.

H. Goldstein

REFERENCE

Laird, N.M. and Ware, J.H. (1982). Random-effects models for longitudinal data. *Biometrics* 38, 963-974.

INFERENCE IN HIDDEN MARKOV MODELS.

O. Cappé, E. Moulines and T. Rydén.
New York: Springer-Verlag, 2005,
pp. xvii + 652, US\$89.95.

Contents:

1. Introduction
2. Main definitions and notations

3. Filtering and smoothing recursions
- PART I: State Inference
4. Advanced topics in smoothing
 5. Applications of smoothing
 6. Monte Carlo methods
 7. Sequential Monte Carlo methods
 8. Advanced topics in sequential Monte Carlo
 9. Analysis of sequential Monte Carlo methods
- PART II: Parameter Inference
10. Maximum likelihood inference, Part I: Optimization through exact smoothing
 11. Maximum likelihood inference, Part II: Monte Carlo optimization
 12. Statistical properties of the maximum likelihood estimator
 13. Fully Bayesian approaches
- PART III: Background and Complements
14. Elements of Markov Chain theory
 15. An information-theoretic perspective on order estimation
- PART IV: Appendices

APPENDIX A: Conditioning

APPENDIX B: Linear Prediction

APPENDIX C: Notations

Readership: Statisticians, users of hidden Markov models, research students

The authors describe Hidden Markov Models (HMMs) as "one of the most successful statistical modelling ideas ... in the last forty years." The book considers both finite and infinite sample spaces. The first chapter provides the basic ideas, and a wide range of different areas of application; these include the stochastic modelling of biological sequences, ion channel modelling, capture-recapture, speech recognition, change point detection, stochastic volatility and regime switches in econometrics. Illustrative examples from these areas recur throughout the book. The authors recommend that the book is read initially from the algorithmic perspective, and only then should the reader consider the detailed theory. However, an important feature of the book is its theoretical underpinning, and to follow all of the arguments the reader should be familiar with measure theory. Theory is balanced by simulation approaches, which are given in detail for HMMs, including Gibbs sampling, Metropolis Hastings and Sequential Importance Sampling. Reversible jump MCMC is described for choosing between HMMs of different orders. The last section of the book presents background theory, including material on chains on general state spaces. The great scope of this book has been achieved with the help of R. Douc, C.P. Robert, G. Fort, P. Soulier, S. Boucheron and E. Gassiat, who have variously contributed a number of chapters and chapter sections. This fascinating book offers new insights into the theory and application of HMMs, and in addition it is a useful source of reference for the wide range of topics considered.

University of Kent
Canterbury, U.K.

B.J.T. Morgan

STOCHASTIC MODELLING FOR SYSTEMS BIOLOGY.

D.J. Wilkinson.
Boca Raton, Florida: Chapman and Hall/
CRC Press, 2006, pp. 254.

Contents:

1. Introduction to biological modelling
2. Representation of biochemical networks
3. Probability models
4. Stochastic simulation
5. Markov processes
6. Chemical and biochemical kinetics
7. Case studies
8. Beyond the Gillespie algorithm

- 9. Bayesian inference and MCMC
 - 10. Inference for stochastic kinetic models
 - 11. Conclusions
- APPENDIX: SBML Models

Readership: Final year undergraduate and graduate students of statistics, bioinformatics and systems biology

The author of this text provides the reader with a comprehensive treatise of stochastic kinetic modelling of biological networks. The latest simulation techniques and research methods are presented and illustrated with a selection of examples and figures, as well as software code in R (the open-source statistical programming environment) for the computer-based implementation of a number of the examples in the text. The book is suitable for private study but would provide an excellent course companion for a variety of graduate courses in computational biology. A basic familiarity with linear algebra and matrix theory is assumed but the author covers the necessary mathematical background for a good appreciation of stochastic kinetic modelling of biological networks in the systems biology context. Model representation is greatly assisted by the authors choice of the Systems Biology Markup Language (SBML) which is the closest to a standard that exists in the systems biology area.

CEFAS Lowestoft Laboratory
Lowestoft, U.K.

C.M. O'Brien

DYNAMIC REGRESSION MODELS FOR SURVIVAL DATA.

T. Martinussen and T.H. Schelke.
New York: Springer-Verlag, 2006,
pp. xiii + 470, US\$84.95.

Contents:

1. Introduction
2. Probabilistic background
3. Estimation for filtered counting process data
4. Nonparametric procedures for survival data
5. Additive hazards models
6. Multiplicative hazards models
7. Multiplicative-additive hazards models
8. Accelerated failure time and transformation models
9. Clustered failure time data
10. Competing risks models
11. Marked point process models

APPENDIX A: Khmaladze's Transformation

APPENDIX B: Matrix Derivatives

APPENDIX C: The Timereg Survival Package For R

Readership: Statisticians and biostatisticians

This book is a welcome addition to the literature on survival analysis for several reasons. The coverage of both multiplicative and, especially, additive models with time-varying covariates is well beyond that found in other books. There is also more emphasis on model checking than in most books. The theoretical background is presented rigorously, but details are often sketched or placed in position where they do not interrupt the flow, so the book is enjoyable to read. In addition, many worked examples based on R software are presented, and an R package (timereg) for implementing all the methodology is described in an Appendix and made available *via* the web. An interesting final chapter discusses regression methodology for longitudinal processes which are observed at discrete times, making use of the analogy with marked point processes. This book is an important resource for anyone with an interest in survival or event history analysis.

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J.F. Lawless

STOCHASTIC AGEING AND DEPENDENCE FOR RELIABILITY.

C-D. Lai and M. Xie.
New York: Springer-Verlag, 2006,
pp. xx + 418, US\$89.95.

Contents:

1. Introduction
2. Concepts and applications of stochastic ageing
3. Bathtub shaped failure rate life distributions
4. Mean residual life-concepts and applications in reliability analysis
5. Weibull related distributions
6. An introduction to discrete failure time models
7. Tests of stochastic ageing
8. Bivariate and multivariate ageing
9. Concepts and measures of dependence in reliability
10. Reliability of systems with dependent components
11. Failure time data

Readership: Reliability-analysis researchers and practitioners, graduate students in reliability or applied probability

This book provides a review of how systems age, with emphasis on the dependence properties between components of a system. It begins with the standard basic definitions of hazard rate, mean residual life, and so on, describes bathtub distributions, as well as pointing out inadequacies of the Weibull family, and includes a discussion of discrete failure-time models, tests of constant failure rate, and dependence relationships between two or more lifetime variables. The final chapter gives thirty-three sets of failure-time data which have arisen from various applications, illustrating the various different shapes of distributions which occur. Reliability and survival analysis is now a very large area, and one could not expect a single book to be comprehensive. Nonetheless, I was a little surprised to see only two entries for 'competing risks' in the index in a book partly on dependence concepts in multi-component systems.

The book will provide a useful reference work and would be good supplementary reading for a graduate course on reliability analysis.

Imperial College of Science,
Technology and Medicine
London, U.K.

D.J. Hand

ANALYSIS OF INTEGRATED AND COINTEGRATED TIME SERIES WITH R.

B. Pfaff.
New York: Springer-Verlag, 2006,
pp. xi + 139, US\$49.95.

Contents:

PART I: Theoretical Concepts

1. Stationary autoregressive-moving average (ARMA) processes
2. Nonstationary time series
3. Cointegration

PART II: Unit Root Tests

4. Testing for the order of integration
5. Further considerations

PART III: Cointegration

6. Single equation methods
7. Multiple equation methods

Readership: Final year undergraduate and graduate students of statistics and econometrics

Topics in stationary and non-stationary time series, together with their application to univariate and multivariate analyses are covered in this book. The text is divided into three main parts — broadly covering introductory concepts of stochastic processes in econometrics, tests for trends and the order of integration, and the methodology

underlying cointegration. The main focus is on approaches that are applicable within econometrics where much of the formal models, hypotheses and test statistics have been developed. Integrated, seasonally integrated, and fractionally integrated time series will be familiar to many statisticians but the concept of cointegration less so. The author explains how easily the methods and tools can be implemented in R – the open-source statistical programming environment. Exercises are provided at the end of each chapter and give the reader an opportunity to apply the presented tests and methods to previously published data sets. The text is suitable for private study but would provide an excellent course companion to computer-based laboratory classes.

CEFAS Lowestoft Laboratory
Lowestoft, U.K.

C.M. O'Brien

STOCHASTIC PROCESSES IN SCIENCE,
ENGINEERING AND FINANCE.

F. Beichelt.

London: Chapman and Hall/CRC Press,
pp. xiv + 417, US\$89.95; £39.99.

Contents:

1. Probability theory
2. Basics of stochastic processes
3. Random point processes
4. Markov chains in discrete time
5. Markov chains in continuous time
6. Martingales
7. Brownian motion

Readership: Senior undergraduate students and graduate students in mathematical and applied sciences with an interest in applied probability.

This book is a self-contained pre-measure theory introduction to stochastic processes with emphasis on applications, to repair and replacement problems in operations research and to actuarial risk analysis. The book assumes little more than basic probability (it includes an introductory chapter on probability theory) and mathematical maturity. The material is supported with many end-of-chapter problems, making it suitable as a course text.

University of Waterloo
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D.L. McLeish

BINOMIAL MODELS IN FINANCE.

J. van der Hoek and R.J. Elliott.
New York: Springer-Verlag, 2006,
pp. xiv + 303, US\$79.95.

Contents:

1. Introduction
2. The binomial model for stock options
3. The binomial model for other contracts
4. Multiperiod binomial models
5. Hedging
6. Forward and futures contracts
7. American and exotic option pricing
8. Path-dependent options
9. The Greeks
10. Dividends
11. Implied volatility trees
12. Implied binomial trees
13. Interest rate models
14. Real options

APPENDIX A: The Binomial Distribution

APPENDIX B: An Application of Linear Programming

APPENDIX C: Volatility Estimation

APPENDIX D: Existence of a Solution

APPENDIX E: Some Generalizations

APPENDIX F: Yield Curves and Splines

Readership: MBA students, undergraduate students in mathematics, statistics and economics, practitioners

This is a textbook on the mathematics of pricing and hedging financial derivatives with discrete stochastic models. It is directed towards a readership that is interested in the principles and applications of mathematical finance without having to deal with the technicalities of stochastic calculus. Therefore the book focuses on the so-called Cox-Ross-Rubinstein or binomial model, together with its various extensions. A nice feature is the very clear descriptions of many financial terms, which, on the one hand, are often missing in more mathematics-oriented books and, on the other hand, can be somewhat imprecise in textbooks aiming at the business community. A good example is the precise distinction between futures and forward contracts. Chapters 12 through 14 discuss subjects one rarely finds in other textbooks on mathematical finance: Chapter 12 deals with implied binomial trees, Chapter 13 introduces a couple of discrete-time models for interest rate curves, and Chapter 14 contains a novel discussion of real options.

Berlin University of Technology
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A. Schied

MONTE CARLO SIMULATION AND FINANCE.

D.L. McLeish.

Hoboken, New Jersey: Wiley, 2005,
pp. xii + 387, £55.00/US\$89.95.

Contents:

1. Introduction
 2. Some basic theory of finance
 3. Basic Monte Carlo methods
 4. Variance reduction techniques
 5. Simulating the value of options
 6. Quasi-Monte Carlo multiple integration
 7. Estimation and calibration
 8. Sensitivity analysis, estimating derivatives, and the Greeks
 9. Other methods and conclusions
- Notes

Readership: Practitioners, researchers, senior undergraduate and graduate students of finance

Monte Carlo simulation provides a valuable tool in quantitative finance. The pricing of derivatives and other financial instruments is often based on complex mathematical models. It is now possible to compute the price of these instruments in practice using Monte Carlo techniques and the high computational power available. The book explains how to use Monte Carlo simulation in the valuation of financial instruments. The author focuses on particular problems where Monte Carlo simulation can play a very important role. The book provides insights and methodologies for problem formulation, model selection, calibration, simulation and analysis of the results. A set of exercises in the back of each chapter facilitates the use of the book for teaching quantitative finance. There is a useful Notes section, where the reader can find references to more comprehensive treatments of the subjects approached in each chapter of the book.

University of Warwick
Coventry, U.K.

A. Dias

NOTES

THE PRINCE OF MATHEMATICS.CARL FRIEDRICH GAUSS.

M.B.W. Tent.

Wellesley, Massachusetts:

A.K. Peters, 2006,

pp. xviii + 245, US\$27.95.

From the book jacket: "This narrative of Gauss' life is based on the stories Gauss told about himself and letters and descriptions that have come down to us. The vignettes and conversations are based as closely as possible on reports of what actually happened. The stories of three-year-old Gauss correcting his father's arithmetic and later falling into the canal and of ten-year-old Gauss figuring the sum of the first 100 counting numbers in school are all classics that have been told about Gauss many times over the years."

From the preface: "The author tells the engaging life story of Carl Friedrich Gauss, the 18th-century mathematician, from his prodigious childhood to his extraordinary achievements that earned him the title 'Prince of Mathematics'."

ONCE UPON EINSTEIN.

T. Damour. Translated by E. Novak.

Wellesley, Massachusetts: A.K. Peters,

2006, pp. xiii + 185, US\$24.95.

From the back cover: "It is well known that Einstein founded twentieth-century physics with his work on relativity and quanta. But what is really known of the essential ideas contributed by Einstein? How were they discovered? What should we retain today from the conceptual upheavals he initiated? Through a selection of concrete scenes taken from Einstein's life, this book offers a view into the formation of his theories, as well as reminders of the day-to-day applications of his ideas.

"The author also leads us through a reflection on their philosophical impact. How should we think of time according to the theory of relativity, which removes any meaningful "now" and shows that twins can have different ages? How should we think of reality when quantum theory predicts that spatially separated objects nevertheless remain connected through the "entanglement" indicated by Einstein, the observable consequences of which have recently been verified?"

THEORIES ON THE SCRAP HEAP. SCIENTISTS AND PHILOSOPHERS ON THE FALSIFICATION, REJECTION, AND REPLACEMENT OF THEORIES.

J. Losee.

Pittsburgh: University of Pittsburgh Press,

2005, pp. viii + 206, US\$24.95.

From the back cover: "*Theories on the Scrap Heap* examines the subject of rejected scientific theories through an analysis of case studies from more than two centuries of science. Using excerpts from the work of prominent scientists and philosophers of science, John Losee discusses a sequence of questions about the falsification, rejection, and replacement of theories: When observational evidence conflicts with the assumptions of a theory, does this signify the death of the theory? If rival theories are available to account for an experience, how is the choice between them to be made? Are there generally accepted criteria by which competing theories may be evaluated? When is the replacement of one theory by another justified?"

"At a time when increasingly complex scientific questions are considered and addressed in a variety of public forums, *Theories on the Scrap Heap* offers guidance

for understanding how the scientific method works in theory formation and rejection."

PLOWS, PLAGUES, AND PETROLEUM. HOW HUMANS TOOK CONTROL OF CLIMATE.

W.F. Ruddiman.

Princeton University Press, 2005,

pp. xiv + 202, US\$24.95.

From the book jacket: "The impact on climate from 200 years of industrial development is an everyday fact of life, but did humankind's active involvement in climate change really begin with the industrial revolution, as commonly believed? William Ruddiman's provocative new book argues that humans have actually been changing the climate for some 8,000 years—as a result of the earlier discovery of agriculture.

"The "Ruddiman Hypothesis" will spark intense debate. We learn that the impact of farming on greenhouse gas levels, thousands of years before the industrial revolution, kept our planet notably warmer than if natural climate cycles had prevailed—quite possibly forestalling a new ice age.

"*Plows, Plagues, and Petroleum* is the first book to trace the full historical sweep of human interaction with Earth's climate. Ruddiman takes us through three broad stages of human history: when nature was in control; when humans began to take control, discovering agriculture and affecting climate through CO₂ and methane emissions; and, finally, the more recent human impact on climate change. Along the way he raises the fascinating possibility that plagues, by depleting human populations, also affected reforestation and thus climate—as suggested by dips in greenhouse gases when major pandemics occurred. The book concludes by looking to the future and critiquing the impact of special interest money on the global warming debate.

"Eminently readable and far-reaching in argument, *Plows, Plagues, and Petroleum* shows us that even as civilization developed, we were already changing the climate in which we lived."

MATH MADE VISUAL. CREATING IMAGES FOR UNDERSTANDING MATHEMATICS.

C. Alsina and R.B. Nelsen.

Washington, D.C.: The Mathematical

Association of America, 2006,

pp. xv + 173, US\$49.95.

From the back cover: "Is it possible to make mathematical drawings that help to understand mathematical ideas, proofs and arguments? The authors of this book are convinced that the answer is yes and the objective of this book is to show how some visualization techniques may be employed to produce pictures that have both mathematical and pedagogical interest.

"Mathematical drawings related to proofs have been produced since antiquity in China, Arabia, Greece and India, but only in the last thirty years has there been a growing interest in so-called "proofs without words." Hundreds of these have been published in *Mathematics Magazine* and *The College Mathematics Journal*, as well as in other journals, books and on the World Wide Web.

"Often times, a person encountering a "proof without words" may have the feeling that the pictures involved are the result of a serendipitous discovery or the consequence of exceptional ingenuity on the part of the picture's creator. In this book the authors show that behind most of the pictures "proving" mathematical relations are some well-understood methods. As the reader shall see, a given mathematical idea or relation may have many different im-

ages that justify it, so that depending on the teaching level or the objectives for producing the pictures, one can choose the best alternative."

YEARNING FOR THE IMPOSSIBLE. The Surprising Truths of Mathematics.

J. Sitwell.

Wellesley, Massachusetts: A.K. Peters, 2006, pp. vii + 230, US\$29.95.

From the book jacket: "Our history is full of great accomplishments that arose from confronting a challenge that was generally considered impossible: circumnavigating the globe, scaling Mount Everest, even landing on the moon. The same is true of the history of mathematics.

"This book explores that history through a lens focused on the creative tension between common sense and the "impossible" as the author follows the discovery and invention of new concepts that have marked mathematical progress, including irrational and imaginary numbers, the fourth dimension, curved space, infinity, and more.

"Drawing connections to art, literature, philosophy, and physics, this book examines the place of mathematics in our intellectual landscape."

GEOMETRIC DATA STRUCTURES FOR COMPUTER GRAPHICS.

E. Langetepe and G. Zachmann.

Wellesley, Massachusetts: A.K. Peters, 2006, pp. xiii + 339, US\$59.00.

From the back cover: "*Geometric Data Structures for Computer Graphics* presents many ways in which data structures and algorithms from computational geometry help to solve problems in computer graphics in an elegant and efficient manner. Readers of this book will be able to recognize geometric problems and select the most suitable data structure when developing computer graphics algorithms."

THE GAME PROGRAMMER'S GUIDE TO TORQUE.

E.F. Maurina, III.

Wellesley, Massachusetts: A.K. Peters, 2006, pp. ix + 608 + disk, US\$59.00.

From the back cover: "*The Game Programmer's Guide to Torque* walks aspiring game makers and industry veterans alike through the well-known and professional proven Torque game-development technology. With clear explanations and detailed discussions of the engine's inner workings, this book is a must-read for any programmer interested in making games — for fun or profit."

VIDEO GAMES AND INTERACTIVE MEDIA. A GLIMPSE AT NEW DIGITAL ENTERTAINMENT.

S. Natkin.

Wellesley, Massachusetts: A.K. Peters, 2006 pp. vii + 150, US\$19.95.

From the back cover: "The revenues generated by video games and their ubiquitous impact on millions of players have surpassed traditional forms of entertainment, including the movie industry. The future of interactive media with its worldwide communication potential is just unfolding. Based on intimate knowledge of the history, management, technology, and economics of game development and design, Stéphane Natkin talks about: the nature of video games, the design of video games, online, proactive, and ubiquitous games, cultural implications of video games."

99 POINTS OF INTERSECTION. EXAMPLES — PICTURES — PROOFS.

H. Walser. Translated by V. Hilton and J. Pedersen. Washington, D.C.: The Mathematical Association of America, 2006, pp. vii + 153, US\$48.50.

From the back cover: "The 99 points of intersection presented here were collected during a year-long search for surprising concurrence of lines. For each example we find compelling evidence for the sometimes startling fact that in a geometric figure three straight lines or sometimes circles, pass through one and the same point. Of course, we are familiar with some examples of this from basic elementary geometry — the intersection of medians, altitudes, angle bisectors, and perpendicular bisectors of sides of a triangle. Here there are many more examples — for figures other than triangles, some where even more than three straight lines pass through a common point.

"The main part of the book presents 99 points of intersection purely visually. They are developed in a sequence of figures, many without caption or verbal commentary. In addition the book contains general thoughts on and examples of the points of intersection, as well as some typical methods for proving their existence. Many of the examples shown in the book were inspired by questions and suggestions made by students and high-school teachers. Several of those examples have not only a geometrical but also an intriguing aesthetic aspect.

"The book addresses high-school students and students at the undergraduate level as well as their teachers, but will appeal to any interested in geometry."

PROJECT ORIGAMI. ACTIVITIES FOR EXPLORING MATHEMATICS.

T. Hull.

Wellesley, Massachusetts: A.K. Peters, pp. xx + 245, US\$30.00.

From the back cover: "When it comes to mathematics, paper is not just for pen and pencil anymore! Origami, the art and science of paper folding, can be used to explain concepts and solve problems in mathematics beyond traditional geometry. The origami activities collected here also relate to topics in calculus, abstract algebra, discrete mathematics, topology, and more. "Using origami, learn about: solving cubic equations; buckyballs, triangle-faced polyhedra, and tori; matrix models for folds; Gaussian curvature, and more.

"These activities, which can enhance the classroom experience, also make great independent student projects and are perfect for math clubs or math circles."

USA AND INTERNATIONAL MATHEMATICAL OLYMPIADS 2005.

Z. Feng, C. Rousseau and M. Matchett Wood (Eds.). Washington, D.C.: The Mathematical Association of America, 2006, pp. xvi + 80, US\$31.95.

From the back cover: "The Mathematical Olympiad books, covering the USA Mathematical Olympiad and the International Mathematical Olympiad, have been published annually by the MAA American Mathematics Competitions since 1976. This is the sixth volume in that series published by the MAA in its Problem Book series."

COMMON ERRORS IN STATISTICS (AND HOW TO AVOID THEM), 2nd edition.

P.I. Good and J.W. Hardin.

Hoboken, New Jersey: Wiley, 2006, pp. xi + 254, £26.50. [Original, 2003]

From the back cover: "Now in a second edition, the highly readable *Common Errors in Statistics (and How to Avoid Them)* lays a mathematically rigorous and readily

accessible foundation for understanding statistical procedures, problems, and solutions. This handy field guide analyzes common mistakes, debunks popular myths, and helps readers to choose the best and most effective statistical technique for each of their tasks.

"Written for both the newly minted academic and the professional who uses statistics in their work, the book covers creating a research plan, formulating a hypothesis, specifying sample size, checking assumptions, interpreting p-values and confidence intervals, building a model, data mining, Bayes' Theorem, the bootstrap, and many other topics. The *Second Edition* has been extensively revised to include: additional charts and graphs, two new chapters, *Interpreting Reports* and *Which Regression Method?*, new sections on practical versus statistical significance and nonuniqueness in multivariate regression, added material from the authors' online courses at statistics.com, new material on unbalanced designs, report interpretation, and alternative modeling methods.

"With a final emphasis on both finding solutions and the great value of statistics when applied in the proper context, this book is eminently useful to students and professionals in the fields of research, industry, medicine, and government."

ADVANCES ON MODELS, CHARACTERIZATIONS AND APPLICATIONS.

N. Balakrishnan, I.G. Bairamov and O.L. Gebizlioglu.
Boca Raton, Florida: Chapman and Hall/CRC Press,
2005, pp. xvii + 234, US\$99.95; £56.99.

From the back cover: "Statistical distributions are one of the most important applied mathematical tools across a wide spectrum of disciplines, including engineering, biological sciences, and health and social sciences. Because they are used to model observed data and ultimately to develop inferential procedures, understanding the properties of statistical distributions is critical to developing optimal inferential methods and validating the resulting model assumptions. *Advances on Models, Characterizations and Applications* offers up-to-date information on many recent developments in the field.

"Comprising fourteen self-contained chapters contributed by internationally renowned experts, this book delineates recent developments on characterizations and other important properties of several distributions, inferential issues related to these models, and several applications of the models to real-world problems. Each chapter is rich with references for further study or more in depth information on each topic and reflects work presented at the International Conference on Advances on Characterizations, Models, and Applications held in Antalya, Turkey, in December 2001.

"*Advances on Models, Characterizations and Applications* provides an updated account of important properties of statistical distributions that reflects their deep importance and broad application and is a welcome addition to the literature."

CLINICAL TRIALS RISK MANAGEMENT.

M. Robinson and S. Cook.
Boca Raton, Florida: CRC Press/
Taylor and Francis, 2006, pp. xv + 211,
US\$179.95/£99.00.

From the back cover: "Drug development is risky business. It is against the backdrop of huge financial, scientific, technical and medical risks that a clinical trials manager is expected to function, effectively identifying and managing all project risks, to deliver a successful outcome. Focusing on the day-to-day needs of a clinical trials manager, *Clinical Trials Risk Management* explains the key concepts and principles of risk management, and how to apply them directly to 'real life' clinical trial situations."

DESIGN OF EXPERIMENTS FOR AGRICULTURE AND THE NATURAL SCIENCES, 2nd edition.

A.R. Hoshmand.
Boca Raton, Florida: Chapman and Hall/CRC Press,
2006, pp. 437, US\$79.95; £29.99.
[Original 1994, *Short Book Reviews*, Vol. 14, p. 44]

The additions in the second edition are in the main an added chapter on covariance analysis and some expanded material on multiple regression and variance analysis.

EXACT AND APPROXIMATE MODELING OF LINEAR SYSTEMS. A BEHAVIORAL APPROACH.

I. Markovsky, J.C. Willems, S. Van Huffel and
B. De Moor.
Philadelphia: Society for Industrial and Applied
Mathematics, 2006, pp. x + 206, US\$64.00.

"*Exact and Approximate Modeling of Linear Systems: A Behavioral Approach* elegantly introduces the behavioral approach to mathematical modeling, an approach that requires models to be viewed as sets of possible outcomes rather than to be *a priori* bound to particular representations. The authors discuss exact and approximate fitting of data by linear, bilinear, and quadratic static models and linear dynamic models, a formulation that enables readers to select the most suitable representation for a particular purpose.

"This book presents exact subspace-type and approximate optimization-based identification methods, as well as representation-free problem formulations, an overview of solution approaches, and software implementation. Readers will find an exposition of a wide variety of modeling problems starting from observed data. The presented theory leads to algorithms that are implemented in C language and in MATLAB."

MODERN ACTUARIAL THEORY AND PRACTICE, 2nd edition.

P. Booth, R. Chadburn, S. Haberman, D. James,
Z. Khorasane, R.H. Plumb and B. Rickayzen.
Boca Raton, Florida: Chapman and Hall/CRC Press,
2005, pp. xxxiii + 799, US\$99.95; £44.99.

From the back cover: "In the years since the publication of the first edition of this best-selling text, the incorporation of ideas and theories from the rapidly growing field of financial economics has precipitated considerable development of thinking in the actuarial profession. The second edition integrates those changes and presents an up-to-date, comprehensive overview of UK and international actuarial theory, practice and modeling. It describes all of the traditional areas of actuarial activity, but in a manner that highlights the fundamental principles of actuarial theory and practice as well as their economic, financial, and statistical foundations."

CHAOS IN AUTOMATIC CONTROL.

W. Perruquetti and J.-P. Barbot (Eds.).
Boca Raton, Florida: CRC Press/
Taylor and Francis, 2006, pp. 564,
US\$139.95; £79.99.

From the back cover: "Chaotic behavior arises in a variety of control settings. In some cases, it is beneficial to remove this behavior; in others, introducing or taking advantage of the existing chaotic components can be useful for example in cryptography. *Chaos in Automatic Control* surveys the latest methods for inserting, taking advantage of, or removing chaos in a variety of applications. This book supplies the theoretical and pedagogical basis of chaos in control systems along with new concepts and recent developments in the field.

"Presented in three parts, the book examines open-loop analysis, closed-loop control, and applications of chaos in control systems. The first section builds a background in the mathematics of ordinary differential and difference equations on which the remainder of the book is based. It includes an introductory chapter by Christian Mira, a pioneer in chaos research. The next section explores solutions to problems arising in observation and control of closed-loop chaotic control systems. These include model-independent control methods, strategies such as H-infinity and sliding modes, polytopic observers, normal forms using homogeneous transformations, and observability normal forms. The final section explores applications in wireless transmission, optics, power electronics, and cryptography."

COMPUTATIONAL METHODS FOR MULTIPHASE FLOWS IN POROUS MEDIA.

Z. Chen, G. Huan and Y. Ma.
Philadelphia, Society for Industrial and Applied Mathematics, 2006,
pp. xxix + 531.

From the back cover: "This book offers a practical introduction to the use of computational methods, particularly finite element methods, in the simulation of fluid flows in porous media. It is the first book to cover a wide variety of flows, including single-phase, two-phase, black oil, volatile, compositional, nonisothermal, and chemical compositional flows in both ordinary porous and fractured porous media. In addition, a range of computational methods are used, and benchmark problems of solution projects from the Society of Petroleum Engineers are presented for the first time in book form.

"The authors review multiphase flow equations and computational methods to introduce basic terminologies and notation. A thorough discussion of practical aspects of the subject is presented, and the level of treatment is rigorous without being unnecessarily abstract. Each chapter ends with bibliographic information and exercises.

"This book can be used as a textbook for graduate or advanced undergraduate students in geology, petroleum engineering, and applied mathematics, and as a reference book for professionals in these fields, and scientists working in the area of petroleum reservoir simulation. It can also be used as a handbook for employees in the oil industry who need to understand modeling and computational methods and by researchers in hydrology, environmental remediation, and some areas of biological tissue modeling. Calculus, physics, and acquaintance with partial differential equations and simple matrix algebra are necessary prerequisites."

DEPENDENCE IN PROBABILITY AND STATISTICS.

P. Bertail, P. Doukhan and P. Soulier (Eds.).
New York: Springer-Verlag, 2006,
pp. viii + 492, US\$69.95.

From the back cover: "This book gives a detailed account of some recent developments in the field of probability and statistics for dependent data. The book covers a wide range of topics from Markov chain theory and weak dependence, with an emphasis on some recent developments on dynamical systems, to strong dependence in time series and random fields. A special section is devoted to statistical estimation problems and specific applications. This book is written as a succession of papers by some specialists of the field, alternating general surveys, mostly at a level accessible to graduate students in probability and statistics, and more general research papers mainly suitable to researchers in the field.

"The first part of the book considers some recent developments on weak dependent time series, including some new results for Markov chains as well as some development on new notions of weak dependence. This part

also intends to fill a gap between the probability and statistical literature and the dynamical system literature. The second part presents some new results on strong dependence, with a special emphasis on non-linear processes and random fields currently encountered in applications. Finally, in the last part some general estimation problems are investigated, ranging from rate of convergence of maximum likelihood estimators to efficient estimation in parametric or non-parametric timeseries models, with an emphasis on applications with non-stationary data."

STUDY DESIGN AND STATISTICAL ANALYSIS: A PRACTICAL GUIDE FOR CLINICIANS.

M.H. Katz.
Cambridge University Press, 2006, pp. xii + 188,
£55.00/US\$88.00 Cloth; £26.99/US\$39.49 Paper.

From the back cover: "This book takes the reader through the entire research process: choosing a question, designing a study, collecting the data, using univariate, bivariate and multivariable analysis, and publishing the results. It does so by using plain language rather than complex derivations and mathematical formulae. It focuses on the nuts and bolts of performing research by asking and answering the most basic questions about doing research studies. It has numerous tables, graphs and tips to help demystify the process. It is filled with up-to-date examples from the clinical literature on how to use statistical analyses to answer important questions."

GRANITE LANDSCAPES OF THE WORLD: GEOMORPHOLOGICAL LANDSCAPES OF THE WORLD.

P. Migoń.
Oxford University Press, 2006,
pp. xxviii + 384, £45.00.

From the back cover: "Granite is one of the most common rocks on Earth. By using examples from all around the world, from the tropics to the polar regions, Piotr Migoń shows how the specific characteristics of the rock itself influence natural landscapes and why natural processes shaping the Earth's surface act so distinctively on granite. Typical granite landforms such as boulders, tors, and inselbergs are examined, as are certain specific environments such as deeply weathered tropical terrains, coasts, and cold-climate uplands. Interactions between natural landscapes and human activity are addressed and specific ways of human transformation of granite landscapes are presented."

TOMORROW'S CITIES, TOMORROW'S SUBURBS.

W.H. Lucy and D.L. Phillips.
Chicago, Illinois: American Planning Association,
pp. xxi + 354, US\$55.95; £35.50.

From the back cover: "Cities ruled the first half of the 20th century. The second half belonged to the suburbs. Will cities become dominant again? Can the recent decline of many suburbs be slowed? Are there ways to restore vibrant life to both?

"*Tomorrow's Cities, Tomorrow's Suburbs* predicts a surprising outcome in the decades-long tug-of-war between urban hubs and suburban outposts. Planning scholars William H. Lucy and David L. Phillips document signs of resurgence in cities and interpret omens of decline in many suburbs. They offer an extensive analysis of the 2000 census, with insights into the influence of income disparities, housing age and size, racial segregation, immigration, and poverty. They also examine popular perceptions — and misperceptions — about safety and danger in cities, suburbs, and exurbs that affect settlement patterns.

"*Tomorrow's Cities, Tomorrow's Suburbs* offers hope that the decline of cities can be halted and reversed, tempered by a warning of the midlife crisis looming in the suburbs. It also offers practical steps that planners, elected officials, and citizens can take to create an environment in which cities and many suburbs can thrive."

A NEW ARCHITECTURE FOR THE U.S. NATIONAL ACCOUNTS.

D.W. Jorgenson, J.S. Landefeld
and W.D. Nordhaus (Eds.).
University of Chicago Press, 2006,
pp. x + 638, US\$99.00/£62.50.

From the book jacket: "*A New Architecture for the U.S. National Accounts* brings together a distinguished group of contributors to initiate the development of a comprehensive and fully integrated set of United States national accounts. The purpose of the new architecture is not only to integrate the existing systems of accounts, but also to identify gaps and inconsistencies and expand and incorporate systems of nonmarket accounts within the core system.

"Since the United States economy accounts for almost thirty percent of the world economy, it is not surprising that accounting for this huge and diverse set of economic activities requires a decentralized statistical system. This volume outlines the major assignments among institutions that include the Bureau of Economic Analysis, the Bureau of Labor Statistics, the Census Bureau, and the Board of Governors of the Federal Reserve System.

"An important part of the motivation for the new architecture is to integrate the different components and make them consistent. This informative volume marks the first step towards achieving that goal."

STATISTICS, SCIENCE AND PUBLIC POLICY IX.

Government, Science and Politics. Proceedings of the Conference on Statistics, Science and Public Policy held at Herstmonceux Castle, Hailsham, U.K., April 21-24, 2004.
A.M. Herzberg and R.W. Oldford (Eds.).
Kingston, Canada: Queen's University,
2005, pp. xiv + 269, Can\$49.95 Cloth;
Can\$29.95 Paper.

"Approximately forty leading scientists, politicians, senior public servants and journalists from several countries met at Herstmonceux Castle in the United Kingdom to consider how to promote better understanding between scientists and policy-makers by focusing on the issue of government, science and politics. This volume consists of the edited version of the proceedings of the conference."

STATISTICS, SCIENCE AND PUBLIC POLICY X.

Education, Economics and Politics. Proceedings of the Conference on Statistics, Science and Public Policy held at Herstmonceux Castle, Hailsham, U.K., April 20-23, 2005.
A.M. Herzberg (Ed.).
Kingston, Canada: Queen's University,
2006, pp. xiii + 175, Can\$49.95 Cloth;
Can\$29.95 Paper.

"Approximately forty leading scientists, politicians, senior public servants and journalists from several countries met at Herstmonceux Castle in the United Kingdom to consider how to promote better understanding between scientists and policy-makers by focusing on the issue of education, economics and politics. This volume consists of the edited version of the proceedings of the conference."

HARD SCIENCE, HARD CHOICES, FACTS, ETHICS AND POLICIES GUIDING BRAIN SCIENCE TODAY.

S.J. Ackerman.
Foreword by R. Fischbach and G. Fischbach.
New York: Dana Press, 2006,
pp. vi + 152, US\$12.95/£8.50.

From the foreword: "This book, *Hard Science, Hard Choices*, synthesizes for general readers a significant scholarly meeting called to discuss recent advances in neuroscience that give rise to ethical issues unprecedented in their consequence to individuals, society, and the body politic.

"The Library of Congress invited the organizers to hold the conference in the Library's classical building on Capitol Hill. There, in May 2005, more than sixty scholars from the fields of neuroscience, law, public policy, and philosophy gathered. The two-day meeting was co-sponsored by the Columbia University College of Physicians and Surgeons, the National Institute of Mental Health, and the Dana Foundation, along with the Library."

The volume is divided into three topics: neuro-imaging, drugs in the brain, neuro-technology.

STREAMFLOW GENERATION PROCESSES.

K.J. Beven (Ed.).
Wallingford, U.K.: IAHS Press,
2006, pp. x + 432, £40.00.

From the back cover: "A series (of papers) from IAHS (International Association of Hydrological Sciences) that collects together, by theme, the scientific papers that provided the foundations for hydrology in the 20th Century. Published across a wide spectrum of disciplines, these papers define the field and provide an overview of the development of ideas that have led to our current concepts and understanding in hydrology."

NEW EDITIONS, PAPER EDITIONS OR REPRINTS

OPTIMAL DESIGN OF EXPERIMENTS.

F. Pukelsheim.
Philadelphia: Society for
Industrial and Applied Mathematics, 2006,
pp. xxix + 454.
[Reprint. Original 1993, Short Book Reviews,
Vol. 14, p. 5]

TIME SERIES ANALYSIS AND ITS APPLICATIONS,

WITH R EXAMPLES, 2nd edition.
R. Shumway and R. Stoffer.
New York: Springer-Verlag, 2006,
pp. vi + 575, US\$89.95
[Original, 2000]

UNITED NATIONS STATISTICAL OFFICE PUBLICATIONS RECENTLY ISSUED

MANUAL FOR THE NATIONAL STANDARDIZATION OF GEOGRAPHICAL NAMES.

United Nations Group of Experts on Geographical Names. ST/ESA/STAT/SER.M/88, 2006, U.N. Sales No. E.06.XVII.7, pp. x + 169.

COLLECTED PAPERS, TABLES, EDITED VOLUMES AND PROCEEDINGS

AMERICAN SERIES IN MATHEMATICAL AND MANAGEMENT SCIENCES. 53 Modern Mathematical, Management, and Statistical Sciences, IV: Advances in Theory and Application, Plus Initiation of International Cooperation with Spanish Speaking Scientists (in English and in Spanish).

American Journal of Mathematics and Management Sciences. Vol.25 (2005) Nos.1 and 2.

E.J. Dudewicz, B.L. Golden, S.N. Mishra and Z. Govindarajulu (Eds.).

Columbus, Ohio: American Sciences Press, 2005, pp. 205.

CALIBRATION AND RELIABILITY IN GROUNDWATER MODELLING: FROM UNCERTAINTY TO DECISION MAKING.

M.F.P. Bierkens, J.C. Gehrels and K. Kovac (Eds.).

Wallingford, U.K.: IAHS Press, 2006, pp. xii + 316, £59.00.

GEO MORPHICAL PROCESSES AND HUMAN IMPACTS IN RIVER BASINS.

R.J. Batalla and C. Garcia.

Wallingford, U.K.: IAHS Press, 2005, pp. xii + 244, £47.00.

HYDROLOGY 2002: AN INTEGRATING SCIENCE TO MEET WORLD WATER CHALLENGES.

T. Oki, C. Valeo and K. Heal (Eds.).

Wallingford, U.K.: IAHS Press, 2006, pp. xxxii + 190, £45.00.

PREDICTIONS IN UNGAUGED BASINS: INTERNATIONAL PERSPECTIVES ON THE STATE OF THE ART AND PATHWAYS FORWARD.

S. Franks, M. Sivapalan, K. Takeuchi and Y. Tachikawa.

Wallingford, U.K.: IAHS Press, 2006, pp. viii + 520, £84.00.

PREDICTIONS IN UNGAUGED BASINS: PROMISES AND PROGRESS.

M. Sivapalan, T. Wagener, S. Uhlenbrook, X. Liang, V. Lakshmi, P. Kumer, E. Zehe and Y. Tachikawa (Eds.).

Wallingford, U.K.: IAHS Press, 2006, pp. vii + 520, £84.00.

BOOKS RECEIVED

A FRESH START FOR COLLEGIATE MATHEMATICS.

Rethinking the Courses Below Calculus.

N. Baxter Hastings (Ed.).

F.S. Gordon, S.P. Gordon and J. Narayan (Assoc. Eds.).

Washington, D.C.: The Mathematical Association of America, 2006, pp. xi + 396, US\$51.50.

CONTROL PERSPECTIVES ON NUMERICAL ALGORITHMS AND MATRIX PROBLEMS.

A. Bhaya and E. Kaszkurewica.

Philadelphia: Society for Industrial and Applied Mathematics, 2006, pp. xxv + 272.

INVARIANT SUBSPACES OF MATRICES WITH APPLICATIONS.

I. Gohberg, P. Lancaster and L. Rodman.

Philadelphia: Society for Industrial and Applied Mathematics, 2006, pp. xxi + 692.

PROBABILITY AND RANDOM PROCESSES FOR ELECTRICAL AND COMPUTER ENGINEERS.

J.A. Gruber.

Cambridge University Press, 2006, pp. xii + 628, £40.00/US\$80.00.

THE STRUCTURAL REPRESENTATION OF PROXIMITY MATRICES WITH MATLAB.

L. Hubert, P. Arabie and J. Meulman.

Philadelphia: Society for Industrial and Applied Mathematics, 2006, pp. xvi + 214.

TOPOLOGY NOW!

R. Messer and P. Straffin.

Washington, D.C.: The Mathematical Association of America, 2006, pp. xi + 240, US\$49.95.

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