Yurinsha Book News

Grundlehren der mathematischen wissenschaften,

Band 339: **Dierkes, U. / Hildebrandt, S. /Tromba, A.:** 440-120

Minimal Surfaces, Part I 2nd ed.

Minimal Surfaces is the first volume of a three volume treatise on minimal surfaces (Grundlehren Nr. 339-341).
The first volume begins with an exposition of basic ideas of the theory of surfaces in three-dimensional Euclidean space, followed by an introduction of minimal surfaces as stationary points of area, or equivalently, as surfaces of zero mean curvature.
The final definition of a minimal surface is that of a non-constant harmonic mapping X: O-> R3 which is conformally parametrized on O-> R2 and may have branch points.
Thereafter the classical theroy of minimal surfaces is surveyed, comprising many examples, a treatment of Bjorling's initial value problem, reflection principles, a formula of the second variation of area, the theorems of Bernstein, Heinz, Osserman, and Fujimoto.

Apr. 2010 680 pp.
9783642116971 19,890.

Band 340: Dierkes, U. /Hildebrandt, S. /Tromba, A.: 詳報掲載 Page 8
Regularity of Minimal Surfaces, 2nd ed.
Apr. 2010 575 pp. 9783642116995 19,890.

Band 341: Dierkes, U. /Hildebrandt, S. /Tromba, A.: 詳報掲載 Page 8
Global Analysis of Minimal Surfaces, 2nd ed.
Apr. 2010 560 pp. 9783642117053 19,890.

Springer

http://www.yurinsha.com
ホームページは毎月25日更新予定です

No. 440 Feb. 2010
数理科学 友隣社 洋書専門

新刊特集

Colloquium Publications,

Vol. 57: **Friedlander, J. /Iwaniec, H.:**
Opera de Cribro 440-007

This is a comprehensive and up-to-date treatment of sieve methods.
The theory of the sieve is developed thoroughly with complete and accessible proofs of the basic theorems.
Included is a wide range of applications, both to traditional questions such as those concerning primes, and to areas previously unexplored by sieve methods, such as elliptic curves, points on cubic surfaces and quantum ergodicity.
New proofs are given also of some of the central theorems of analytic number theory; these proofs emphasize and take advantage of the applicability of sieve ideas.
The book contains numerous comments which provide the reader with insight into the workings of the subject, both as to what the sieve can do and what it cannot do.

May 2010 529 pp.
9780821849705 14,010.

Mathematical Surveys and Monographs,

Vol. 161: **Agarwal, R. /Perera, K. /O'Regan, D.:**
Morse Theoretic Aspects of p-Laplacian Type Operators 440-107

The purpose of this book is to present a Morse theoretic study of a very general class of homogeneous operators that includes the p-Laplacian as a special case. The p-Laplacian operator is a quasilinear differential operator that arises in many applications such as non-Newtonian fluid flows and turbulent filtration in porous media.
Infinite dimensional Morse theory has been used extensively to study semilinear problems, but only rarely to study the p-Laplacian.
The standard tools of Morse theory for computing critical groups, such as the Morse lemma, the shifting theorem, and various linking and local linking theorems based on eigenspaces, do not apply to quasilinear problems where the Euler functional is not defined on a Hilbert space or is not C^2 or where there are no eigenspaces to work with.

Apr. 2010 202 pp.
9780821849682 9,380.

Vol. 160: **Kechris, A.:** 440-083
Global Aspects of Ergodic Group Actions

The subject of this book is the study of ergodic, measure preserving actions of countable discrete groups on standard probability spaces.
It explores a direction that emphasizes a global point of view, concentrating on the structure of the space of measure preserving actions of a given group and its associated cocycle spaces.
These are equipped with canonical topological actions that give rise to the usual concepts of conjugacy of actions and cohomology of cocycles.
Structural properties of discrete groups such as amenability, Kazhdan's property (T) and the Haagerup Approximation Property play a significant role in this theory as they have important connections to the global structure of these spaces. One of the main topics discussed in this book is the analysis of the complexity of the classification problems of conjugacy and orbit equivalence of actions, as well as of cohomology of cocycles.

Feb. 2010 237 pp.
9780821848944 10,470.

A. M. S.

Contemporary Mathematics,

440-066

Vol. 510: **Bonk, M. /Gilman, J. / Masur, H. /Minsky, Y. /Wolf, M. (eds.): In the Tradition of Ahlfors-Bers, V**

The Ahlfors-Bers Colloquia commemorate the mathematical legacy of Lars Ahlfors and Lipman Bers. The core of this legacy lies in the fields of geometric function theory, Teichmuller theory, hyperbolic geometry, and partial differential equations.
However, the work of Ahlfors and Bers has impacted and created interactions with many other fields of mathematics, such as algebraic geometry, dynamical systems, topology, geometric group theory, mathematical physics, and number theory. Recent years have seen a flowering of this legacy with a large number of people entering the subject. This current volume contains articles on a wide variety of subjects that are central to this legacy. These include papers in Kleinian groups, classical Riemann surface theory, translation surfaces, algebraic geometry and dynamics.

Apr. 2010 329 pp.
9780821847329 13,460.

AMS Chelsea Publishing,

440-108

Vol. 369: **Agmon, S.: Lectures on Elliptic Boundary Value Problems**

This book, which is a new edition of a book originally published in 1965, presents an introduction to the theory of higher-order elliptic boundary value problems.
The book contains a detailed study of basic problems of the theory, such as the problem of existence and regularity of solutions of higher-order elliptic boundary value problems. It also contains a study of spectral properties of operators associated with elliptic boundary value problems. Weyl's law on the asymptotic distribution of eigenvalues is studied in great generality.
Table of Contents: *Notations and conventions *Calculus of L^2 derivatives--Local properties *Calculus of L^2 derivatives--Global properties *Some inequalities *Elliptic operators *Local existence theory etc.

Mar. 2010 210 pp.
9780821849101 5,440.

AMS/Chelsea

Freiberger, W. (ed.): Proceedings of the Brown University Conference on Nonlinear Wave Equations in honor of Walter A. Strauss on his 70th Birthday, 2008

440-104

This book is a special issue of the Quarterly of Applied Mathematics journal. It represents the proceedings of the conference in honor of Walter Strauss's 70th birthday held at Brown University (Providence, RI) in May of 2008. The issue offers a collection of original and expository articles devoted to the study of nonlinear wave equations.
The articles cover a wide range of topics, including scattering theory, dispersive waves, classical field theory, mathematical fluid mechanics, kinetic theory, and stability theory.
The book offers a nice cross-section of current trends and research directions in the study of nonlinear wave equations.

Mar. 2010 178 pp.
9781000022193 6,660.

Brown University/A. M. S.

新刊特集

Frontiers in Mathematics

Borsuk, M.: 440-116

Transmission Problems for Elliptic Second -Order Equations in Non -Smooth Domains

The goal of this book is to investigate the behaviour of weak solutions to the elliptic transmisssion problem in a neighborhood of boundary singularities: angular and conic points or edges.
We consider this problem both for linear and quasi-linear equations. Chapter 1 is of auxiliary character. Chapter 2 deals with the eigenvalue problem for the m-Laplace-Beltrami operator. By the variational principle we prove a new integro-differential Friedrichs-Wirtinger type inequality. This inequality is a basis for the obtaining of precise exponents of the decreasing rate of the solution near boundary singularities.
Chapter 3 deals with the investigation of the transmission problem for linear elliptic second order equations in the domains with boundary conic point. Chapter 4 is devoted to the transmission problem in conic domains with N different media for an equation with the Laplace operator in the principal part. Chapters 5, 6 and 7 deal with the investigation of the transmission problem for quasi-linear elliptic second order equations in the domains with boundary conic point or with an edge at the boundary of a domain.

Apr. 2010 200 pp.
9783034604765 5,570.

ANHA: Applied and Numerical Harmonic Analysis

Christensen, O.: 440-012

Functions, Spaces, and Expansions

This graduate-level textbook presents a detailed exposition of key mathematical tools in analysis, which will appeal to students and professionals across science and engineering.
Every topic covered has been specifically chosen because it plays a role outside the field of pure mathematics, so although the treatment of each is mathematical in nature, and concrete applications are not delineated, the principles and tools presented are quite useful when exploring the computational areas of physics and engineering.

Mar. 2010 280 pp.
9780817649791 7,370.

Klein, F. /Sommerfeld, A.: 440-022

The Theory of the Top, Vol. 2: Development of the Theory for the Heavy Symmetric Top

This book is the second installment of a series of four self-contained English translations of the classic and definitive treatment of rigid body motion.
The Theory of the Top was originally presented by Felix Klein as an 1895 lecture at Gottingen University that was broadened in scope and clarified as a result of collaboration with Arnold Sommerfeld. Graduate students and researchers interested in theoretical and applied mechanics will find this a thorough and insightful account.
Other volumes in this series include Introduction to the Kinematics and Kinetics of the Top, Perturbations: Astronomical and Geophysical Applications, and Technical Applications of the Theory of the Top.

June 2010 300 pp.
9780817648244 12,910.

Birkhauser

Graf, U.: 440-127

Introduction to Hyperfunctions and Their Integral Transforms: An Applied and Computational Approach

This textbook presents an introduction to generalized functions through Sato's hyperfunctions, i.e. based on complex variables theory.
Laplace transforms, Fourier transforms, Hilbert transforms, Mellin tranforms and Hankel transforms of hyperfunctions and ordinary functions are then treated, and some applications mainly to integral equations are presented.

Apr. 2010 430 pp.
9783034604079 11,930.

Modern Birkhauser Classics

Alon, N. /Bourgain, J. / 440-003
Connes, A. /Gromov, M. /Milman, V. (eds.):

Visions in Mathematics: GAFA 2000 Special Volume, Part I: pp. 1 -453

"Visions in Mathematics - Towards 2000" was one of the most remarkable mathematical meetings in recent years.
It was held in Tel Aviv from August 25th to September 3rd, 1999, and united some of the leading mathematicians worldwide.
The goals of the conference were to discuss the importance, the methods, the past and the future of mathematics as we enter the 21st century and to consider the connection between mathematics and related areas.
The aims of the conference are reflected in the present set of survey articles, documenting the state of art and future prospects in many branches of mathematics of current interest.
This is the first part of a two-volume set that will serve any research mathematician or advanced student as an overview and guideline through the multifaceted body of mathematical research in the present and near future.

Feb. 2010 470 pp.
9783034604215 8,940.

Alon, N. /Bourgain, J. / 440-004
Connes, A. /Gromov, M. /Milman, V. (eds.):

Visions in Mathematics: GAFA 2000 Special Volume, Part II: pp. 455 -983

Feb. 2010 535 pp.
9783034604246 8,940.

Filippov, A.: 440-015

The Versatile Soliton 2010 2nd Printing

The soliton, a solitary wave impulse preserving its shape and strikingly similar to a particle, is one of the most fascinating and beautiful phenomena in the physics of nonlinear waves.
In this classic book, the concept of the soliton is traced from the beginning of the last century to modern times, with recent applications in biology, oceanography, solid state physics, electronics, elementary particle phyiscs, and cosmology.
"In summary, this book is a good elementary treatment of solitons and the related history of physics and mathematics, even for readers with little knowledge of advanced mathematics." - Mathematical Reviews

Feb. 2010 262 pp.
9780817649739 7,370.

Birkhauser

Cambridge Tracts in Mathematics,

Vol. 182: **Kolokoltsov, V.:** 440-131
Nonlinear Markov Processes and Kinetic Equations

A nonlinear Markov evolution is a dynamical system generated by a measure-valued ordinary differential equation with the specific feature of preserving positivity.
This feature distinguishes it from general vector-valued differential equations and yields a natural link with probability, both in interpreting results and in the tools of analysis.
This brilliant book, the first devoted to the area, develops this interplay between probability and analysis. After systematically presenting both analytic and probabilistic techniques, the author uses probability to obtain deeper insight into nonlinear dynamics, and analysis to tackle difficult problems in the description of random and chaotic behavior.
The book addresses the most fundamental questions in the theory of nonlinear Markov processes: existence, uniqueness, constructions, approximation schemes, regularity, law of large numbers and probabilistic interpretations. Its careful exposition makes the book accessible to researchers and graduate students in stochastic and functional analysis with applications to mathematical physics and systems biology.

Sep. 2010 **450 pp.**
9780521111843 **10,030.**

Lecture Notes in Logic,

Delon, F. /Kohlenbach, U. /Maddy, P. /Stephan, F. (eds.):
Logic Colloquium 2007

The Annual European Meeting of the Association for Symbolic Logic, also known as the Logic Colloquium, is among the most prestigious annual meetings in the field.
The current volume, Logic Colloquium 2007, with contributions from plenary speakers and selected special session speakers, contains both expository and research papers by some of the best logicians in the world.
This volume covers many areas of contemporary logic: model theory, proof theory, set theory, and computer science, as well as philosophical logic, including tutorials on cardinal arithmetic, on Pillay's conjecture, and on automatic structures.

Apr. 2010 **281 pp.** 440-046
9780521760652 **11,220.**

Feferman, S. /Parsons, C. /Simpson, S.: 440-014
Kurt Godel: Essays for his Centennial

Kurt Godel (1906-1978) did groundbreaking work that transformed logic and other important aspects of our understanding of mathematics, especially his proof of the incompleteness of formalized arithmetic.
This book on different aspects of his work and on subjects in which his ideas have contemporary resonance includes papers from a May 2006 symposium celebrating Godel's centennial as well as papers from a 2004 symposium.
Proof theory, set theory, philosophy of mathematics, and the editing of Godel's writings are among the topics covered.
Several chapters discuss his intellectual development and his relation to predecessors and contemporaries such as Hilbert, Carnap, and Herbrand.

Mar. 2010 **375 pp.**
9780521115148 **11,880.**

Cambridge

London Mathematical Society Lecture Note Series,

Vol. 375: **Holm, T. /Jorgensen, P. /Rouquier, R.:**
Triangulated Categories 440-080

Over the last few decades triangulated categories have become increasingly important, to the extent that they can now be viewed as a unifying theory underlying major parts of modern mathematics.
This collection of survey articles, written by leading experts, covers fundamental aspects of triangulated categories, as well as applications in algebraic geometry, representation theory, commutative algebra, microlocal analysis and algebraic topology.

Sep. 2010 250 pp.
9780521744317 7,920.

Vol. 374: **Alinhac, S.:** 440-109
Geometric Analysis of
Hyperbolic Differential Equations

Its self-contained presentation and 'do-it-yourself' approach make this the perfect guide for graduate students and researchers wishing to access recent literature in the field of nonlinear wave equations and general relativity.
It introduces all of the key tools and concepts from Lorentzian geometry (metrics, null frames, deformation tensors, etc.) and provides complete elementary proofs.
The author also discusses applications to topics in nonlinear equations, including null conditions and stability of Minkowski space.

May 2010 135 pp.
9780521128223 6,600.

Vol. 373: **Majadas, J. /Rodicio, A.:** 440-091
Smoothness, Regularity, & Complete Intersection

Written to complement standard texts on commutative algebra, this short book gives complete and relatively easy proofs of important results, including the standard results involving localisation of formal smoothness (M. Andre) and localisation of complete intersections (L. Avramov), some important results of D.Popescu and Andre on regular homomorphisms, and some results from A.Grothendieck's EGA on smooth homomorphisms.
The authors make extensive use of the Andre-Quillen homology of commutative algebras, but only up to dimension 2, which is easy to construct, and they deliberately avoid using simplicial methods.

May 2010 160 pp.
9780521125727 6,600.

Vol. 372: **Lepowsky, J. /McKay, J. /Tuite, M. (eds.).):**
Moonshine - The First Quarter Century & Beyond:
Proceedings of a Workshop on
the Moonshine Conjectures and Vertex Algebras.

In 1979, John Conway and Simon Norton's famous paper, 'Monstrous Moonshine', outlined the remarkable connection between the monster group M and the theory of modular functions.
The search for an explanation of this phenomenon involved the development and application of diverse areas of mathematics, including (generalized) Kac-Moody algebras, vertex (operator) algebras, automorphic forms and elliptic cohomology, together with string and conformal field theory from theoretical physics.

Apr. 2010 360 pp. 440-087
9780521106641 11,880.

Cambridge

Encyclopedia of Mathematics and its Applications,

Vol. 136: **Kristaly, A. /Radulescu, V. /Varga, C.:** 440-184
Variational Principles in
Mathematical Physics, Geometry and Economics:
Qualitative Analysis of
Nonlinear Equations & Unilateral Problems

This comprehensive introduction to the calculus of variations and its main principles also presents their real-life applications in various contexts: mathematical physics, differential geometry, and optimization in economics. Based on the authors' original work, it provides an overview of the field with examples and exercises suitable for graduate students entering research. The method of presentation will appeal to readers with diverse backgrounds in functional analysis, differential geometry and partial differential equations.
Each chapter includes detailed heuristic arguments, providing thorough motivation for the material developed later in the text.

Oct. 2010 **400 pp.**
9780521117821 **13,200.**

Vol. 135: **Berthe, V. /Rigo, M. (eds.):** 440-007
Combinatorics, Automata, and Number Theory

This collaborative volume presents recent trends arising from the fruitful interaction between the themes of combinatorics on words, automata and formal language theory, and number theory. Presenting several important tools and concepts, the authors also reveal some of the exciting and important relationships that exist between these different fields.
Topics include numeration systems, word complexity function, morphic words, Rauzy tilings and substitutive dynamical systems, Bratelli diagrams, frequencies and ergodicity, Diophantine approximation and transcendence, asymptotic properties of digital functions, decidability issues for D0L systems, matrix products and joint spectral radius.
Topics are presented in a way that links them to the three main themes, but also extends them to dynamical systems and ergodic theory, fractals, tilings and spectral properties of matrices.

Aug. 2010 **550 pp.**
9780521515979 **14,780.**

Vol. :132: **Schmidt, G.:** 440-055
Relational Mathematics

Relational mathematics is to operations research and informatics what numerical mathematics is to engineering: it is intended to help modelling, reasoning, and computing.
Its applications are therefore diverse, ranging from psychology, linguistics, decision aid, and ranking to machine learning and spatial reasoning. Although many developments have been made in recent years, they have rarely been shared amongst this broad community of researchers.
This first comprehensive overview begins with an easy introduction to the topic, assuming a minimum of prerequisites; but it is nevertheless theoretically sound and up to date. It is suitable for applied scientists, explaining all the necessary mathematics from scratch using a multitude of visualised examples, via matrices and graphs.
It ends with tangible results on the research level.

June 2011 **600 pp.**
9780521762687 **13,460.**

Cambridge

Grundlehren der mathematischen wissenschaften,

Band 339: **Dierkes, U. /Hildebrandt, S. /Tromba, A.:**
Minimal Surfaces, Part I. 2nd ed. 440-120
Apr. 2010 680 pp. 詳報 表紙 掲載
9783642116971 19,890.

Band 340: **Dierkes, U. /Hildebrandt, S. /Tromba, A.:**
Regularity of Minimal Surfaces, 2nd ed.

"Regularity of Minimal Surfaces" begins with survey of minimal surfaces with free boundaries. Following this, the basic results concerning the boundary behaviour of minimal surfaces and H-surfaceswith fixed or free boundaries are studied.
In particular, the asymptotic expansions at interior and boundary branch points are derived, leading to general Gauss-Bonnet formulas.
Furthermore, gradient estimates and asymptotic expansions for minimal surfaces with only piecewise smooth boundaries are obtained.
One of the main features of free boundary value problems for minimal surfaces is that, for principal reasons, it is impossible to deriva a priori estimates. 440-121
Apr. 2010 575 pp.
9783642116995 19,890.

Band 341: **Dierkes, U. /Hildebrandt, S. /Tromba, A.:**
Global Analysis of Minimal Surfaces, 2nd ed.

Many properties of minimal surfaces are of a global nature, and this is already true for the results treated in the first two volumes of the treatise. Part I of the present book can be viewed as an extension of these results. For instance, the first two chapters deal with existence, regularity and uniqueness theorems for minimal surfaces with partially free boundaries. Here one of the main features is the possibility of "edge-crawling" along free parts of the boundary.
The third chapter deals with a priori estimates for minimal surfaces in higher dimensions and for minimizers of singular integrals related to the area functional. In particular, far reaching Bernstein theorems are derived.
The second part of the book contains what one might justly call a "global theory of minimal surfaces" as envisioned by Smale.
First, the Douglas problem is treated anew by using Teichmuller theory. Secondly, various index theorems for minimal theorems are derived, and their consequences for the space of solutions to Plateau's problem are discussed. Finally, a topological approach to minimal surfaces via Fredholm vector fields in the spirit of Smale is presented. 440-122
Apr. 2010 560 pp.
9783642117053 19,890.

Ergebnisse der Mathematik und ihrer Grenzgebiete 3 Folge

Band 40: **Ribes, L. /Zalesskii, P.:** 440-102
Profinite Groups, 2nd ed.

The book is reasonably self-contained. Profinite groups are Galois groups. As such they are of interest in algebraic number theory. Much of recent researchon abstract infinite groups is related to pro-finite groups because residually finite groups are naturally embedded in a profinite group.
In additionto basic facts about general profinite groups, the book emphasizes free constructions.
Feb. 2010 483 pp.
9783642016417 27,850.

Springer

Lecture Notes in Mathematics,

Vol. 1294: **Queffelec, M.:** 440-032
Substitution Dynamical Systems - Spectral Analysis, 2nd ed.
Feb. 2010 332 pp. << 246 pp.
9783642112119 13,920.

Chiarella, C. et al. (eds.): 440-117
Contemporary Quantitative Finance
Several contributors to this volume write a series of articles outlining contemporary advances in a number of key areas of mathematical finance such as, optimal control theory applied to finance, interest rate models, credit risk and credit derivatives, use of alternative stochastic processes, numerical solution of equations of mathematical finance, estimation of stochastic processes in finance.
The list of authors contains many of the researchers who have made the major contributions to these various areas of mathematical finance. This volume addresses both researchers and professionals in financial institutions, as well as regulators working in the above mentioned fields.
Feb. 2010 440 pp.
9783642034787 17,900.

EAA Lecture Notes

Ohlsson, E. /Johansson, B.: 440-193
Non -Life Insurance Pricing with Generalized Linear Models
Non-life insurance pricing is the art of setting the price of an insurance policy, taking into consideration varoius properties of the insured object and the policy holder.
Introduced by British actuaries generalized linear models (GLMs) have become today a the standard aproach for tariff analysis.
The book focuses on methods based on GLMs that have been found useful in actuarial practice and provides a set of tools for a tariff analysis.
Basic theory of GLMs in a tariff analysis setting is presented with useful extensions of standarde GLM theory that are not in common use.
The book meets the European Core Syllabus for actuarial education and is written for actuarial students as well as practicing actuaries.
Feb. 2010 180 pp.
9783642107900 7,950.

Statistics and Computing

Muenchen, R. /Hilbe, J.: 440-189
R for Stata Users
Stata is the most flexible and extensible data analysis package available from a commercial vendor. R is a similarly flexible free and open source package for data analysis, with over 3,000 add-on packages available.
This book shows you how to extend the power of Stata through the use of R. It introduces R using Stata terminology with which you are already familiar. It steps through more than 30 programs written in both languages, comparing and contrasting the two packages' different approaches.
When finished, you will be able to use R in conjunction with Stata, or separately, to import data, manage and transform it, create publication quality graphics, and perform basic statistical analyses.
Apr. 2010 542 pp.
9781441913173 17,900.

Springer

Mathematical Olympiad,

Vol. 6: **Jiagu, X.:**

Lecture Notes on Mathematical Olympiad Courses 2 Vols. Set

Olympiad mathematics is not a collection of techniques of solving mathematical problems but a system for advancing mathematical education. This book is based on the lecture notes of the mathematical Olympiad training courses conducted by the author in Singapore.
Its scope and depth not only covers and exceeds the usual syllabus, but introduces a variety concepts and methods in modern mathematics.
In each lecture, the concepts, theories and methods are taken as the core. The examples are served to explain and enrich their intension and to indicate their applications. Besides, appropriate number of test questions is available for reader's practice and testing purpose.
Their detailed solutions are also conveniently provided.

Dec. 2009 400 pp.
9789814293532 5,440.

Vol. 6 - 1: **Jiagu, X.:**
Lecture Notes on Mathematical Olympiad Courses, Vol. 1
Dec. 2009 200 pp. 9789814293549 3,400.

Vol. 6 - 2: **Jiagu, X.:**
Lecture Notes on Mathematical Olympiad Courses, Vol. 2
Dec. 2009 200 pp. 9789814293556 3,400.

Peking University Series in Mathematics,

Vol. 5: **Qiu, W.:**

Difference Sets and Their Applications

This book introduces the recent progress on the multiplier conjecture, prime power conjecture, Lander conjecture; including the author's and his graduate student T Feng's work on the multiplier conjecture.
It provides a sufficiently broad introduction to algebraic approach for studying difference sets, including group ring, representation theory of finite groups, cyclotomic fields, etc.
It also introduces the intricate relationships between difference sets and cryptography, for example, quasi-perfect sequences and cyclic (4n-1, 2n-1, n-1)- difference sets, bent functions and Hadamard difference sets, perfect nonlinear maps and semiregular relative difference sets.

Dec. 2009 300 pp.
9789814280761 10,610.

Marcolli, M.:

Feynman Motieves: Renormalization, Algebraic Varieties, and Galois Symmetries

This book presents recent and ongoing research work aimed at understanding the mysterious relation between the computations of Feynman integrals in perturbative quantum field theory and the theory of motives of algebraic varieties and their periods.
The main question is whether residues of Feynman integrals always evaluate to periods of mixed Tate motives, as appears to be the case from extensive computations of Feynman integrals carried out by Broadhurst and Kreimer. Two different approaches to the subject are described.

Dec. 2009 236 pp.
9789814271202/9789814304481 5,710./3,260. (Paper ed.)

World Scientific Pub.

EMS Tracts in Mathematics,

Vol. 9: **Bockel, G. /Pink, R.:** 440-065
Cohomological Theory of Crystals Over Function Fields

This book develops a new cohomological theory for schemes in positive characteristic p and it applies this theory to give a purely algebraic proof of a conjecture of Goss on the rationality of certain L-functions arising in the arithmetic of function fields.
These L-functions are power series over a certain ring A, associated to any family of Drinfeld A-modules or, more generally, of A-motives on a variety of finite type over the finite field Fp. By analogy to the Weil conjecture, Goss conjectured that these L-functions are in fact rational functions.
In 1996 Taguchi and Wan gave a first proof of Goss's conjecture by analytic methods a la Dwork.

Oct. 2009 195 pp.
9783037190746 9,550.

EMS Series of Lectures in Mathematics, Series

Khalkhali, M.: 440-084
Basic Noncommutative Geometry

The book can be used either as a textbook for a graduate course on the subject or for self-study. It will be useful for graduate students and researchers in mathematics and theoretical physics and all those who are interested in gaining an understanding of the subject.
One feature of this book is the wealth of examples and exercises that help the reader to navigate through the subject. While background material is provided in the text and in several appendices, some familiarity with basic notions of functional analysis, algebraic topology, differential geometry and homological algebra at a first year graduate level is helpful.
Developed by Alain Connes since the late 1970s, noncommutative geometry has found many applications to long-standing conjectures in topology and geometry and has recently made headways in theoretical physics and number theory.

Dec. 2009 239 pp.
9783037190616 7,160.

Heritage of European Mathematics

Springer, T. /van Dalen, D. (eds.): 440-035
Hans Freudenthal, Selecta

The present Selecta are devoted to Freudenthal's mathematical oeuvre, they contain a selection of his major contributions.
Included are fundamental contributions to topology such as the foundation of the theory of ends (in the thesis of 1931), the introduction (in 1937) of the suspension and its use in stability results for homotopy groups of spheres. In group theory there is work on topological groups (of the 1930s) and on various aspects of the theory of Lie groups, such as a paper on automorphisms of 1941. From the later work of the 1950s and 1960s, papers on geometric aspects of Lie theory (geometries associated to exceptional groups, space problems) have been included. Freudenthal's versatility is further demonstrated by a choice from his foundational and historical work: papers on intuitionistic logic and topology, a paper on axiomatic geometry reappraising Hilbert's Grundlagen, and a paper summarizing his development of Lincos, a universal ("cosmic") language.

Oct. 2009 661 pp.
9783037190586 25,470.

European Mathematics