Bibliographie

R. Abraham—J. E. Marsden—T. Ratiu, Manifolds, Tensor Analysis and Applications (Second edition) (Applied Mathematical Sciences, 75), VII+654 pages, Springer-Verlag, New York—Berlin—Heidelberg—London—Paris—Tokyo, 1988.

After opening this book at the first time the reader could think that (except the last chapter) it is a comprehensive reference book of the material indicated in the title. On the one hand this is true if we take into account the very detailed and quite standard treatment of the book. On the other hand this volume renders a lot of ways possible for the reader. This feature of the work is due to its dynamic structure. Most important basic knowledges are given as a consistently treated string from the elements of topology up to Hodge—deRham theory. The remainder (not less important) parts of the topic are presented in supplementary sections in order "*to minimize the necessity of consulting too many outside references*" as it is written in the Preface.

A typical realization of this useful idea is Section 7.2 dealing with Stokes' theorem. After presenting the theorem itself and some consequences (in 13 steps) there are three supplements on "*Stokes' theorem for Nonorientable Manifolds*", and „*...on Manifolds with Piecewise Smooth Boundary*", and „*...on Chains*", respectively (in 12 steps).

We have to mention another useful peculiarity of the work. This is in the large number of exercises at the end of each section. They involve further interesting details concerning the problem in question, and make it possible that this book serve as a basic material of different courses (e.g. above-mentioned section 7.2 ends with interesting exercises from *A to U*).

The volume consists of eight chapters. The first one is devoted to the topological concepts and theorems which will be necessary later on. In Chapter 2 we find the notions and results on Banach Spaces and differential calculus which are used in Chapter 3 („*Manifolds and Vector Bundles*") and Chapter 4 („*Vector Fields and Dynamical Systems*"). Chapter 5 contains an introduction to the tensors. Differential forms and concepts closely related to them are introduced in Chapter 6, while the mathematical treatment closes with the „*Integration on Manifolds*" in Chapter 7. Final chapter is devoted to the physical applications. At this point we have to mention that all the previous chapters were written with respect these latter applications.

Corresponding the main goal of the book the notations are standard. Authors do not use exclusively either the invariant or the coordinate method. It seems to be a successful experience that the use of coordinate or invariant terminology be proper to the problem in question, helping in the geometric imagination, too.

We can recommend this book to everyone who needs a strong basis of knowledges on manifolds and tensor analysis. University lecturers also can use it with considerable advantage.

J. Kozma (Szeged)

W. Ballmann—M. Gromov—V. Schroeder, Manifolds of Nonpositive Curvature (Progress in Mathematics, 61), X+263 pages, Birkhäuser, Boston—Basel—Stuttgart, 1985.

Again a very good book in the subject of differential geometry from Birkhäuser for this once about the manifolds of nonpositive curvature.

The theory of manifolds of nonpositive curvature has been investigated very heavily since about 1981, but unfortunately, until now there has not been any coherent text about it. Some parts of this book can be regarded as a well-ordered collection of the rather chaotic oral presentation of the theory, but at the same time the recent progress of the theory is also included and is presented by articles of W. Ballman and V. Schroeder.

The main part of the book is written by V. Schroeder and is based on Gromov's four lectures at College de France in France. The four lectures are: Simply Connected Manifolds of Nonpositive Curvature; Groups of Isometries; Finiteness Theorems; Strong Rigidity of Locally Symmetric Spaces.

In the last lecture the reader finds the generalization of the famous Mostow rigidity theorem (see the volume 67).

Summing up this volume presents a complete and self-contained description of new results and a lot of background material, so it may serve as an introduction to the subject as well as a reference of the new results.

Árpád Kurusa (Szeged)

I. M. Benn—R. W. Tucker, An Introduction to Spinors and Geometry with Applications in Physics, X+358 pages, Adam Hilger, Bristol and Philadelphia, 1987.

This is an introductory text on spinors and differential geometry intented primarily for students of theoretical, mathematical physics.

After presenting the basic material on tensor algebra in Chapter 1, the authors give a very detailed account of the algebraic theory of Clifford algebras and spinors in the second chapter. A number of tables, an appendix on the algebraic concepts needed to present the theory in its full generality, and an explanation of the conversion rules between the different terminologies preferred by most mathematicians and physicists, respectively, makes this chapter both self-contained and very practical to use. (The section on the conversion rules bears a very expressive title: "The confusion of tongues".) The next chapter completes the algebraic theory by treating pure spinors and triality. Then the authors introduce the concept of differentiable manifolds and elaborate on the corresponding calculus. This is illustrated on physical examples including an account of Galilean spacetimes, Maxwell's equations and Minkowski spacetime. The following, sixth, chapter is devoted to connections, covariant derivatives and curvature. The use of these concepts is illustrated in Chapter 7, where some aspects of gravitation theory are developed. The last three chapters deal with Clifford and spinor calculus on manifolds and with related physical applications.

This book is recommended to those who seek an introduction to the theory of spinors, manifolds and their applications in physics. The exhaustive treatment of Clifford algebras and spinors contained in this book could be especially useful for researchers working in related areas.

László Fehér ((Szeged)

N. Bourbaki, General Topology (Chapters 1—4), VII+437 pages, Springer-Verlag, Berlin—Heidelberg—New York—London—Paris—Tokyo, 1989.

N. Bourbaki, General Topology (Chapters 5—10), IV+636 pages, Springer-Verlag, Berlin—Heidelberg—New York—London—Paris—Tokyo, 1989.

These books are English translations of the well-known origina l French editions. Chapter 1 introduces the most important concepts of general topology, Chapter 2 deals with uniform spaces, completeness, uniform continuity of mappings and investigates the relation between uniform spaces and compact spaces. The other chapters are devoted to the questions in which, in addition to a topological or uniform structure, there are presented some other structures. In Chapter 3 topological groups are studied. Chapter 4 applies the preceding principles to the field of rational numbers and defines the field of real numbers in considerable detail. The succeeding chapters starting from the real numbers considers certain topological spaces which are of particular interest in applications of topology to geometry. Chapter 5 deals with one-parameter groups which leads to the definition and elementary properties of the exponential and logarithmic functions. In Chapter 6 finite dimensional real number vector spaces, the $\mathbf{R}^n$ spaces and real projective spaces are considered. Chapter 7 is devoted to the study of the additive groups of $\mathbf{R}^n$. Chapter 8 introduces the complex numbers, the quaternions, the angular measure and the trigonometric functions. Here the finite dimensional complex vector spaces and complex projective spaces are also investigated. Chapter 9 is devoted to general topology and studies spaces whose topology is generated by means of a distance. Chapter 10 is devoted to the different topologizations of the spaces of continuous functions from a topological space to a uniform space.

The method of exposition is axiomatic and abstract, and it proceeds from the general to the particular. For the reader an extended knowledge of mathematics is needed. At the end of each chapter rich collection of exercises is presented.

L. Gehér (Szeged)

Pierre Brémaud, An Introduction to Probabilistic Modeling (Undergraduate Texts in Mathematics), XVI+207 pages with 90 illustrations, Springer-Verlag, New York—Berlin—Heidelberg—London— Paris—Tokyo, 1988.

This is a first course in probability theory with chapter headings: Basic Concepts and Elementary Models, Discrete Probability, Probability Densities, Gauss and Poisson, Convergences. And it is really a first class first course. The emphasis is on probabilistic model building as the title suggests. The required mathematical background is modest: some introductory calculus and linear algebra is sufficient. There are about 150 worked out intelligent exercises and the special feature is nine illustrations of modeling from stochastic processes, information theory and statistics. The book is written with great care and a fine taste. It is one of the best one-semester introductory texts in probability.

Sándor Csörgő (Szeged)

Adhemar Bultheel, Laurent Series and their Padé Approximations, IX+274 pages, Birkhäuser Verlag, Basel—Boston, 1987.

The Padé approximation means the local approximation of analytic or meromorphic functions by rational ones. This branch of the approximation theory is very important in solving a large scale of problems in numerical analysis, linear system theory, stochastics and other fields.

In this book the central problem is the so-called Laurent-Padé approximation in which a ratio of two Laurent polynomials is sought which approximates the two directions of the Laurent series simultanously.

The first part of this volume (up to Chapter 11) is basicly algebraic. Its main part is devoted to the most important three types of recursive algorithms applied in the solution of the basic Padé problems. The first one is the Trench—Zohar algorithm for Toeplitz matrix inversion. The second one is a nonsymmetric version of the Schur algorithm; and the third type of algorithm is of rhombus type and this is essentially the Rutishauser qd algorithm from numerical analysis.

The second part of the volume is analytic in nature. The Padé approximation problem is considered for meromorphic in $C\setminus\{0\}$ functions. For example classical and more recent results on the asymptotic behavior of Hankel and Toeplitz determinants and the projection method are used for proving convergence in columns and rows of Padé tables. For the Laurent-Padé problem, convergence of the columns is essentially the same as in the classical case. For the row convergence however, some new method had to be used and it is one of the most important results of this monograph. This part (in particular Chapter 17) contains some interpretation of the Padé approximation problem in other theories like Carathéodory and Schur function classes, Szegő polynomials orthogonal on the unit circle, prediction theory and inverse scattering.

At the end of the book some interesting examples are worked out.

The book is well organized, fairly readable and very valuable for everybody interested in approximation theory.

J. Németh (Szeged)

Tammo tom Dieck—Ian Hambleton, Surgery Theory and Geometry of Representations (DMV Seminar, 11), VII+115 pages, Birkhäuser Verlag, Basel—Boston—Berlin, 1988.

This volume is in fact two books since it consists of two parts which can be read independently.

The first part is written by T. tom Dieck (Representation forms and homotopy representations) and is concerned with examples related to representations of finite groups and group actions on spheres.

The second part is written by I. Hambleton (An Introduction to Calculations in Surgery) and reviews the general setting of surgery theory.

Reading the book needs a basic education of reader in differential and algebraic topology, so we recommend it to young mathematicians as an introduction to this subject, which has a great deal of current interest, as well as to any mathematicians who wants to know what this subject is actually.

Árpád Kurusa (Szeged)

Discrete Groups in Geometry and Analysis. Papers in Honor of G. D. Mostow on his Sixtieth Birthday. Edited by Roger Howe (Progress in Mathematics, 67), XII+210 pages, Birkhäuser, Boston—Basel—Stuttgart, 1987.

This volume is dedicated to the excellent mathematician George D. Mostow whose research has mostly concerned the geometry of Lie groups and the discrete subgroups of Lie groups (one of his most famous book is: Strong Rigidity of Locally Symmetric Spaces). The book contains a very short biography of D. G. Mostow and six papers.

These papers are based on talks given by P. Deligne, I. Igusa, D. Johnson & J. Millson, A. Mostow, Y.—T. Siu, and J. Zimmer at the Conference on Discrete Groups in Geometry and Analysis. This conference was held at Yale in March 1986 in honor of the 60th birthday of G. D. Mostow.

The articles in this volume are not simply technical reports or research summaries, but contain well-organized developments of significant mathematics. Zimmer's, Sui's, and Millson's papers are directly connected to Mostow's Strong Rigidity Theorem (super rigidity for cocycles, strong rigidity of Kähler manifolds). Deligne deals with monodromy actions of fundamental groups of moduli spaces. Igusa's problem in distribution theory is the premise of Igusa's article. Mostow considers problem on function division motivated by gauge field theory.

Árpád Kurusa (Szeged)

Dynamical Systems I, Edited by D. V. Anosov and V. I. Arnold (Encyclopaedia of Mathematical Sciences, 1), X+233 pages, Springer-Verlag, Berlin—Heidelberg—New York—London—Paris—Tokyo, 1988.

It is a general experience nowadays that more and more fields in the sciences need mathematics. New and deep mathematical applications have appeared e.g. in computer science, information technology, economics, theoretical biology, medicine. This phenomenon necessitates high level mathematical reference books accessible to specialists in very different fields. The first volume of the series Encyclopaedia of Mathematical Sciences is devoted in this spirit to the theory of dynamical systems which is one of the most widely applied topics in mathematics.

The book consists of two parts. The first one (Ordinary Differential Equation) is due to V. I. Arnold and Yu. S. Il'yashenko. They give an excellent survey on this classical field involving the newest directions of the investigation. The chapters are the following: Basic Concepts; Differential Equations on Surfaces; Singular Points of Differential Equations in Higher Dimensional Real Phase Space; Singular Points of Differential Equations in Higher Dimensional Complex Phase Space; Singular Points of Vector Fields in the Real and Complex Planes; Cycles, Analytic Theory of Differential Equations.

The second part (Smooth Dynamical Systems) written by D. V. Anosov, S. Kh. Aranson, I. U. Bronshtein and V. Z. Grines is concerned with the modern geometric theory of differential equations. The chapters are: Basic concepts; Elementary Theory; Topological Dynamics; Flows on Two-Dimensional Manifolds.

This book of outstanding Soviet mathematicians is indispensable for every mathematician and user of mathematics interested in dynamical systems and their applications. Certainly, it will serve as the basic reference book of the modern theory of differential equations.

L. Hatvani (Szeged)

Function Spaces and Applications (Proceedings, Lund 1986), Edited by M. Cwikel, J. Peetre and H. Wallin (Lecture Notes in Mathematics, 1302), VI+445 pages, Springer-Verlag, Berlin—Heidelberg—New York—London—Paris—Tokyo, 1988.

This book contains the material of thirty five lectures held on a seminar in Lund in June 1986. The seminar was devoted to function space methods in analysis and particularly to interpolation spaces. The idea of the organizers was to bring together mathematicians also from other selected areas of analysis. At the end of the book a glimpse into unsolved problems can be found.

L. Gehér (Szeged)

Functional Analysis, Proceedings. Edited by E. Odell and H. Rosenthal (Lecture Notes in Mathematics, 1332), 202 pages, Springer-Verlag, Berlin—Heidelberg—New York—London—Paris—Tokyo, 1988.

This volume contains 14 papers which are based on talks given at a seminar at the University of Texas at Austin during 1986—87. Some of these papers are expository of nature presenting often new and more or less self-containing proofs for known results. In other papers new results are proved possibly not always in the final elaboration. The exposition in both kinds of papers pays attention to the background of the discussed topic and is completed with an informative list of references.

The themes of the articles range over a wide fild, especially Banach spaces, convexity theory, harmonic analysis, Banach algebras and topology. This variety makes it sure that a great number of researchers and graduate students will find inspirative material in this outlet of a workshop in mathematics.

E. Durszt (Szeged)

L. Garding—T. Tambour, Algebra for Computer Science (Universitext), ix+198 pages, Springer-Verlag, Berlin—Heidelberg—New York—London—Paris—Tokyo, 1988.

As the authors put in their preface: "The aim of this book is to give the reader a general education in number theory, algebra and group theory and in the application of these parts of mathematics to computer science." Taking a look at the chapter headings (Number Theory; Number Theory and Computing; Abstract Algebra and Modules; The Finite Fourier Transform; Rings and Fields; Algebraic Complexity Theory; Polynomial Rings, Algebraic Fields, Finite Fields; Shift Registers and Coding; Groups; Boolean Algebra; Monoids, Automata, Languages) it could be asked how they managed to pack into some two hundred pages all this material. The solution relies on a truly concise way of presentation, a balance between referenced and fully proved results (the verification of some theorems are left to the reader) and a well-chosen set of examples and exercises.

Naturally, no selection can cover the huge amount of algebraic notions and methods applied in computer science. Coding theory, algebraic complexity theory, finite Fourier transforms, formal power series and regular languages are introduced in a pure algebraic setting. This makes it possible to indicate the central notions and results in a few pages. The efforts of the authors to give a relatively full account on the basics must be appreciated. In spite of this I miss (at least the definition of) lattices and universal algebras because in some subfields of computer science (e.g. semantics and parallel processes) they play a definite role.

The book can be recommended to all computer science students.

J. Virágh (Szeged)

I. M. Gelfand, Collected Papers, Volume II. Edited by S. G. Gindinkin, V. W. Guillemin, A. A. Kirillov, B. Konstant and S. Sternberg, X+1039 pages, Springer-Verlag, Berlin—Heidelberg—New York—London—Paris—Tokyo, 1988.

This volume of I. M. Gelfand's Collected Papers is devoted to his works in the field of representation theory. It is quite well known that Gelfand's long activity in this field was very fruitful and school-establishing; however, the present "documentation" is certainly fascinating even for experts.

The papers (many of them joint ones) are essembled into nine sections according to their themes. Anyone, who looks ever the "Table of contents", realizes at once: this material is connected with many different branches of mathematics.

Each paper is presented in English. An "Appendix" consists of contributions of G. Segal and C. M. Ringel and a "Bibliography" lists Gelfand's works in chronological order.

Probably the majority of mathematicians have some personal experiences in connection with Gelfand's works but surely a great number of mathematicians can find useful and instructive material of his/her interest in this collection.

E. Durszt (Szeged)

François Gieres, Geometry of Supersymmetric Gauge Theories (Lecture Notes in Physics, 302,) VIII+189 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1988.

This book gives a self-contained account of supersymmetric Yang-Mills theories. The author develops the classical theory in great detail, from a nice geometric point of view. Particular attention is paid to the explanation of the BRS-method, which plays an important role in many recent theoretical developments.

The table of contents is the following: The canonical geometric structure of rigid superspace and SUSY transformations; The general structure of SYM-theories; Classical SYM-theories in the gauge real representation; BRS-differential algebras in SYM-theories; Geometry of extended supersymmetry.

There are included also six uselful appendices, which contain the conventions and some background material, and also a self-contained account (based on unpublished notes of R. Stora) of anticommuting spinors in ordinary and supersymmetric field theories.

This clearly written, detailed and informative presentation of supersymmetric gauge theories is recommended to graduate students as well as to researchers working in this field in related areas.

László Fehér (Szeged)

Semyon Grigorevich Gindikin, Tales of Physicists and Mathematicians (translated from Russian by Alan Shuchat), XII+157 pages with 30 illustrations, Birkhäuser, Boston—Basel, 1988.

The original (Russian) edition of this book is based on several articles published in Quant Magazine over the course of several years. These discussed principal events in the history of science (mostly mathematics and physics). In this volume a time span of four centuries is covered: from the real rebirth of European mathematics, the solution of the third-order polynomial equation till Gauss.

There are five main parts of this collection. The first one is based on Cardan's Ars Magna (The Great Art) and deals with the cubic equations. It is followed by two tales of Galileo: The Discovery of the Laws of Motion and The Medicean Stars. The third part deals with Christian Huygens work on pendulum clocks and with a curve "not at all considered by the ancients". The fourth part is devoted to Blaise Pascal, and the last one to the "Prince of Mathematicians", to Gauss. Several branches of his researches are touched from the fundamental theorem of (classical) algebra to the non-Euclidean Geometry and to electrodynamics and terrestial magnetism.

In spite of the fact that most of the material of this volume can be read in several books on the history of science, it was an excellent idea to bring them together in one volume.

Lajos Klukovits (Szeged)

Allan Gut, Stopped Random Walks. Limit Theorems and Applications (Applied Probability. A Series of the Applied Probability Trust, 5), IX+199 pages, Springer-Verlag, New York—Berlin—Heidelberg—London—Paris—Tokyo, 1988.

Let $X_1, X_2, \ldots$ be independent and identically distributed random variables. In many applied problems in sequential analysis and renewal theory, instead of the usual random walk $S_n = X_1 + \ldots + X_n$, $n \geqq 1$, one has to study the asymptotic behaviour of a randomly indexed walk $S_{N(t)}$ as $t \to \infty$. There is an enormous literature on this, and the book reviews a part of it. Its main theme, however, is the most important special case when the $N(t)$ are stopping times for the walk. This in itself is a large field and Gut's book does a good job in giving a very nice account of this topic in a well-digested and unified fashion. Moment inequalities, various modes of convergence or the law of large numbers with refinements, the law of the iterated logarithm, the central limit theorem and its functional versions for $S_{N(t)}$ are treated and a good number of applications are sketched or discussed in detail. A good graduate course can be based on the book.

Sándor Csörgő (Szeged)

V. I. Istratescu, Inner Product Structures, Theory and Applications (Mathematics and its Applications), XV+895 pages, D. Reidel Publishing Company, Dordrecht—Boston—Lancaster, Tokyo, 1987.

It is a very hard question if this book is a monograph or a general work. In some sense it is a monograph since its subject is the inner product structures, but at the same time it contains many branches of mathematics which are investigated in many monographs in its own right. In fact the subject of this book covers some topics from analysis, geometry, probability theory, functional analysis and physic, which explains the size of the book (about 900 pages!).

The volume gives a comprehensive introduction to the theory of inner product structures together with some applications to diverse filds, emphasizing the significance of the relationships between the general theory and its applications. Many references are scattered throughout the book, which has References about 50 pages, and most of the sections contain remarks directed to the literature involving related results. It is worth noting that the last chapter contains several problems, connected with the inner product structures.

This book likely becomes a standard reference of the topics covered by inner product structures because of its clear style and nice execution.

Árpád Kurusa (Szeged)

M. Jantzen, Confluent String Rewriting (EATCS Monographs on Theoretical Computer Science, 14), X+126 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1988.

The main goal of the book is given in the best way in the Preface as follows: "Replacement systems, such as term rewriting systems, tree manipulating systems, and graph grammars, have been used in Computer Science in the context of theorem proving, program optimization, abstract data types, algebraic simplification, and symbolic computation. Replacement systems for strings arose about seventy years earlier in the area of combinatory logic and group theory. The most natural and appropriate formalism for dealing with string rewriting is the notion of a semi-Thue system and this monograph treats its central aspects.

The réduction relation is here defined firstly by the direction of the rules and secondly by some metric that yields efficient algorithms. These systems are general enough to discuss the basic notions of arbitrary replacement systems, such as termination, confluence, and the Church—Rosser property in its original meaning.

Confluent semi-Thue systems in which each and every derivation consists of finitely many steps only are called complete; they guarantee the existence of unique normal forms as canonical representatives of the Thue congruence classes. Each such system can be considered a nondeterministic algorithm for the word problem which works correctly without backtracking. This is often conceptually simpler and more elegant than an ad hoc construction. In many cases a replacement system can be altered to a complete system by the Knuth—Bendix completion method.

However, it has been shown with the help of semi-Thue systems that there **exist** structures for which the Knuth—Bendix completion method will never terminate, since no finite complete rewriting system exists to resolve the word problem even though it is solvable by other methods. Thue systems thus serve as counter-examples or can be used as examples in the study of other replacement systems, since strings can encode many other structures and those, in turn, can often simulate string rewriting systems. Therefore the study of Thue systems is important and the experience gained thereby should be transferred to other more elaborate systems."

"Since many of the notions we use for string rewriting systems are very general we start with the basic notions for general reduction systems and then introduce the specific definitions we need in connection with semi-Thue systems. The second chapter presents results on decidability questions. The third chapter is devoted to formal languages that are definable as finite unions of congruence classes of some finite Thue system. A field in which interest is still growing is the connection with deterministic context-free languages through NTS grammars. In Chapter 4 the connection between groups, monoids, and complete semi-Thue systems is discussed. This chapter contains an interesting example of a group which has no finite complete presentation on certain generators. The last chapter contains new and as yet unpublished results which generalize this example. It serves as a detailed exposition of techniques and new methods. The list of references and further reading is intended to contain not only the literature of direct use but also additional work which adds to the understanding of the theory and its applications."

This very nice monograph may be recommended to everybody interested in the theory of rewriting systems.

Sándor Vágvölgyi (Szeged)

Michio Kaku, Introduction to Superstrings (Graduate Texts in Contemporary Physics), XVI + 568 pages, Springer-Verlag, New York—Berlin—Heidelberg—London—Paris—Tokyo, 1988.

Superstring theory is one of the most active current areas of research in theoretical physics. It may or may not prove to be the final "theory of everything", but it is undoubtedly a fascinating subject with new physical ideas and very strong mathematical connections.

This is a comprehensive introduction to superstrings with emphasis on the latest developments including string field theory, multiloop amplitudes, four-dimensional strings, the use of Teichmüller spaces, index theorems and the BRST method; just to mention a few key words. The reader is supposed to be familiar with the basic results and methods of quantum field theory and relativity, although these are also reviewed at the beginning of the book and in the appendices.

This book is primarily intended as a graduate text, but it can also be used as a handbook of modern methods. It is recommended to everybody interested in superstring theory.

L. Fehér (Szeged)

Hans Loeffel, Blaise Pascal (Vita Mathematica), 175 Seiten, Birkhäuser Verlag, Basel—Boston—Stuttgart, 1987.

Die überwiegende Mehrheit der Pascal gewidmenten Literatur beschäftigt sich mit dem Schiftsteller und Philosophen. Aber wie auch der Verfasser im Vorwort schreibt: Mit den Ausklammerungen des mathematischen Wirkens verfehlt man den Kern der Pascalschen Denkweise und die existentielle Problematik seiner Persönlichkeit. Das Buch von Loeffel stellt uns Pascal als Mathematiker und Physiker vor.

Nach einem bigraphischen Teil, folgen einzelne Kapitel über seine Entdeckungen in chronologisch geordneter Form: die projektive Geometrie der Kegelschnitte, die Rechenmaschine, das arithmetische (Pascalsche) Dreieck, die Wahrscheinlichkeitsrechnung, die Infinitesimalrechnung und die Experimente für die Messung des Luftdrucks, also auch ein Thema aus der Physik. Das Buch ist in einer solchen Weise geschrieben, daß es auch ein Nichtmathematiker leicht lesen kann. Man findet viele Originaltexte in Französisch und gleich darauf die deutsche Übersetzung. Doch auch diese Sätze brauchen eine weitere Erläuterung, weil Pascal seine mathematische Ideen rein verbal ausdrückte und nicht in dem schon damals existierenden mathematischen Formalismus. Besonders interessant, jedoch auch fragwürdig, ist ein Kapitel am Ende des Buches über den Pascalschen Kosmos, in dem der Verfasser versucht, einige theologischen und philosophischen Gedanken mit mathematischen Formeln auszudrücken, wie es Pascal getan hätte, wenn er die gewöhnliche Sprache der Mathematik benutzt hätte.

Etwa die Hälfte der 84 Abbildungen dient zum Illustrieren der Mathematik, der andere Teil der Figuren ist eine wunderbare Sammlung von Porträts und Photographien von Büchern und Handschriften. Diese Illustrationen erhöhen den Wert dieses schönen Bandes weiter, der nicht nur eine bemerkenswerte mathematisch-historische Arbeit ist, sondern auch ein ausgezeichnetes kulturhistorisches Werk.

M. G. Benedict (Szeged)

D. S. Lubinsky—E. B. Saff, Strong Asymptotics for Extremal Polynomials Associated with Weights on R (Lecture Notes in Mathematics, 1305), VII+153 pages, Springer-Verlag, Berlin—Heidelberg—New York—London—Paris—Tokyo, 1988.

The aim of this research monograph is to establish strong or Szegő type asymptotics for extremal polynomial with weights on **R**. Namely one of the directions in this topic corresponds to the *nth root asymptotics* of orthogonal polynomials in the plane (asymptotics for $p_n(a_n z)^{1/n}$); another type of the asymptotics for the recurrence relation coefficients corresponds to stronger *ratio asymptotics* (asymptotics for $p_n(a_n z)/p_{n-1}(a_n z)$) in the plane. A still stronger asymptotic is an asymptotic for leading coefficients of orthogonal polynomials that in turn leads to asymptotics for $p_n(a_n z)$ in the plane. These *strong or power asymptotics* for L_p extremal errors and extremal polynomials form the main focus of this monograph.

The reader interested only in a statement of the main results need refer only to sections 3 and 4. The work is fairly self-contained and so the reader should not have to refer too many other papers for proofs. Sections 5, 6, 9, 10 and 13 contain background material on integral equations, potential theory, and Bernstein's formula. Section 7 contains an investigation of the sharpness of infinite-finite range inequalities and section 8 contains inequalities for the largest zeros of extremal polynomials. Sections 11 and 12 contain the construction of the weighted polynomial approximations and sections 14 to 16 contain the proofs of the asymptotics for extremal errors and extremal polynomials. At the end of the volume there are 72 references.

The monograph is very well written. It is warmly recommended to research workers interested in approximation theory and orthogonal polynomials.

J. Németh (Szeged)

Robert A. McCoy—Ibula Ntantu, Topological Properties of Spaces of Continuous Functions (Lecture Notes in Mathematics, 1315), IV+124 pages, Springer-Verlag, Berlin—Heidelberg—New York—London—Paris—Tokyo, 1988.

The main purpose of this book is to deduce the topological properties of the space of continuous functions $C(X, R)$ from the topological space X to the topological space R, from those of X and R. The spaces X and R are assumed to be completely regular spaces, furthermore the range space R is assumed to contain a nontrivial path. The two classes of natural topologies on $C(X, R)$ which are studied here are set-open topologies, which contain especially the pointwise convergence topology and the compact-open topology, and the uniform topologies.

The text consists of five chapters and a short historical note. The first three chapters give the basic definitions and properties and develop the classical theory of function spaces. The two final chapters are devoted to the characterization of many topological properties of function spaces, particularly in Chapter 4 the range space R is always the space of real numbers endowed with the usual topology. At the end of all the chapters a rich collection of exercises and problems can be found. The book is recommended not only to specialists but to all mathematicians, who are interested in this discipline or will learn this one.

L. Gehér (Szeged)

R. Mines—F. Richman—W. Ruitenburg, A Course in Constructive Algebra (Universitext), XI+344 pages, Springer-Verlag, New York—Berlin—Heidelberg—London—Paris—Tokyo, 1988.

The constructive approach to mathematics has a reneisance in our days. It is partly due to the proliferation of powerful computers, but the influence of E. Bishop's Foundations of Constructive Analysis is unavoidable.

The authors' approach differs from Heyting's intuitionistic algebra which concentrated on algebraic structures over the real numbers, therefore the latter is, in some sense, a handmade of analysis.

In the classical approach to algebra a lot of nonconstructive arguments (e.g. the existence of maximal ideals) are used. In this book the basic notions of modern algebra are presented from a constructive point of view in a somewhat self-contained manner, but the reader must be familiar with the "classical" modern algebra.

The authors emphasize that constructive algebra is a generalization of algebra in that they do not assume the law of excluded middle. They do not limit themselves to a restricted class of "constructive objects" (as a recursive function theorist does) nor do they introduce classically false principles (as an intuitionist does).

The chapter headings are: Sets; Basic Algebra; Rings and Modules; Divisibility in Discrete Domains; Principal Ideal Domains; Field Theory; Factoring Polynomials; Commutative Noetherian Rings; Finite Dimensional Algebras; Free Groups; Abelian Groups; Valuation Theory; Dedekind Domains.

Each part is followed by exercises.

Lajos Klukovits (Szeged)

Pierre Molino, Riemannian Foliations (Progress in Mathematics, 73), XII+339 pages, Birkhäuser, Boston—Basel, 1988.

Riemannian foliation, foliation on a Riemannian manifold with locally constant distance between leaves, is a special type of foliation introduced by B. Reinhart. Recently it seems to be a good candidate for modelling situation drawn from mechanics or physics therefore it is very important notion and heavily studied, which makes this monograph in fact necessary.

The book is divided into two parts. A complete elementary account of the structure theorems for Riemannian foliations is presented in the first part, where the reader can find all the basic ideas introduced in detail and exercises at the end of each chapter. This book presents the first elementary exposition of basic results in Riemannian foliations obtained in the last ten years. In the second part there are five appendices written by specialists (Y. Carriere, V. Sergiescu, G. Cairns, E. Salem, and E. Ghys). These all introduce the reader to one of the topics of current research as Riemannian flows geodesic foliations etc.

Though the first part can be used as a graduate text, we recommend it not only to students but, to mathematicians who make research in this subject either.

Árpád Kurusa (Szeged)

Gregory L. Naber, Spacetime and Singularities (Introduction), IX+178 pages, Cambridge University Press, Cambridge—New York—New Rochelle—Melbourne—Sydenye, 1988.

Starting from the most elementary facts of geometry, this book leads the reader through only 174 pages to one of the peaks of general relativity, to the singularity theorem of Hawking. The titles of the chapters are: The Geometry of Minkowski Spacetime; Some Concepts from Relativistic Mechanics; More General Spacetimes: Gravity; The Proof of Hawking's Theorem. This list shows the milestones of a straight road along which one has to pass to reach the summit. The book is written so well, that stopping anywhere between will not cause a disappointment. The text is aimed at a student in mathematics, but it can be recommended to a physicist too, who wants to get a more precise mathematical description of relativity than it is usual in physics books. On the other hand, short but sufficient physical background is presented everywhere, helping the reader to grasp the physical significance of the theorems deduced. The mathematical definitions are also well motivated, and besides the exact methods everything is explained in simple terms as well. One should state: almost everything is explained. Here and there one finds abbreviations like HE etc. The well educated reader suspects that this must be a reference to the book of Hawking and Ellis, perhaps. In fact the list of the references is missing from the volume. This should be corrected in a second edition, to have a really enjoyable text on this highly interesting subject.

M. G. Benedict (Szeged)

Number Theory Related to Fermat's Last Theorem, Proceedings of the conference held at M. I. T. in 1981. Edited by Neil Koblitz (Progress in Mathematics, 26), X+262 pages, Birkhäuser, Boston—Basel—Stuttgart, 1982.

This is the collection of lectures of the meeting sponsored by the Vaughn Foundation held at M. I. T.'s Endicott House in September 1981. The Last Theorem of Fermat, a 350-year old problem, is still a source of inspiration of the contemporary mathematics.

The conference is focused on four main areas: geometry of Fermat varities, Iwasawa theory of cyclotomic fields, Grössencharakter and special values of L-functions, history.

The 25 papers contained in this volume are written by G. Anderson, A. Baker, S. Chowla and M. Cowles, H. Edwards, L. Federer, E. Friedman, D. Goldfeld and J. Hoffstein and S. J. Patterson, R. Greenberg, B. Grass, G. Harder, D. Hayes, H. W. Lenstra Jr., S. Lichtenbaum, C. R. Matthews, W. McCallum, V. Murty, I. Piatetski-Shapiro, P. Ribenboim, D. Rohrlich, K. Rubin and A. Wiles, T. Shioda, J. Silverman, H. M. Stark, S. Wagstaff, M. Wodshmidt.

Lajos Klukovits (Szeged)

G. K. Pedersen, Analysis Now (Graduate Texts in Mathematics), IX+277 pages, Springer-Verlag, New York—Berlin—Heidelberg—London—Paris—Tokyo, 1988.

The basic aim of this book is to give a survey of the tools of modern analysis. Within each section there are only a few main results and the rest of the material consists of supporting lemmas, explanatory remarks or propositions. The book is self-contained. However, for convenience, a list of classic or established textbooks, covering the same material, has been added. In the Bibliography the reader will also find a number of original papers.

For further orientation here is a characteristic list of chapter headings: General Topology; Banach Spaces; Hilbert Spaces; Spectral Theory; Unbounded Operators; Integration Theory.

This monograph is very useful for a two semester course at the first year graduate level.

It is highly recommended both to instructors and students.

J. Németh (Szeged)

William S. Peters, Counting for Something. Statistical Principles and Personalities (Springer Texts in Statistics), XVIII+275 pages with 46 illustrations, Springer-Verlag, New York—Berlin—Heidelberg—London—Paris—Tokyo, 1987.

There are two basic traditions of the teaching of an introductory statistics course. The continental European approach places emphasis on mathematical rigour usually from the very beginning. On the contrary, the American one teaches a first course in "applied economic", "engineering", or "social" statistics with a very faint mathematical background, and by means of numerical examples tries to outline the basic problems and principles. The present book belongs to the second group. It does not assume any preliminary knowledge, mathematical or otherwise, in any field. Likewise, there is no mathematics whatsoever in the book. However, there is knowledge in it. It covers most of the usual chapters of an introductory statistics book. What is new in it is the historical component or, indeed, context. It is not an introduction to the history of statistics, but tries to be an introduction to statistics through the elements of the history of statistics. An interesting and really enjoyable attempt. I can advise it to my European collegues as a profitable suplementary reading. Many students will like it, hopefully.

Sándor Csörgő (Szeged)

Chris Preston, Iterates of Piecewise Monotone Mappings on an Interval (Lecture Notes in Mathematics, 1347), 166 pages, Springer-Verlag, Berlin—Heidelberg—New York—London—Paris—Tokyo, 1988.

This book is a valuable addition to the literature of the applications of real analysis. For a reader having a correct basis in one-dimensional real analysis, e.g. perhaps he knows the book: Principles of Mathematical Analysis by Rudin, the book is self-contained and it consists only of 162 pgaes. And this is an important thing, since the time factor is not negligible.

In the last two decades discrete dynamical systems play an increasing role as models in the biological and physical sciences. Piecewise monotone mappings can be seen as examples of discrete dynamical systems. Denote by $C(I)$ the set of continuous functions $f: I\to I$, where $I=[a, b]$ a closed bounded interval. Given $f\in C(I)$ let f^n be defined inductively by $f^0=x$, $f^1(x)=f(x)$, $f^n(x)=f(f^{n-1}(x))$ for $n>1$. f^n is the n^{th} iterate of f. $f\in C(I)$ is called piecewise monotone if there exists $N\geqq 0$ and $a=d_0<d_1<...<d_N=b$ such that f is strictly monotone on $[d_k, d_{k+1}]$ for $k=0, ..., N$. The set of piecewise monotone mappings is denoted by $M(I)$.

The book consists of 13 sections. The first section is an introduction. This is unusually long, but remarkably useful. Here the reader can find the themas of the sections in detail, several definitions and results. For the sake of understanding some results are stated "roughly" here. (An example will be given later.) Sections 2 to 6 discuss the question: "What does the asymptotic behaviour of the orbit $(f^n(x))_{n\geqq 0}$ look like for a "typical" point $x\in I$?" The main theorem of this part is the author's results. In the introduction it is stated roughly as follows. (This is the example mentioned earlier.) If $f\in M(I)$ then one of three things happens to the orbit $(f^n(x))_{n\geqq 0}$ of a "typical" point $x\in I$:
(1) The orbit eventually ends up in an f-invariant subset $C\subset I$, C consisting of finitely many closed intervals, on which f acts topologically transitively (which means that the orbit of some point in C is dense in C).
(2) The orbit is attracted to an f-invariant Cantor-like set $R\subset I$, on which f acts minimally (which means that the orbit of each point in R is dense in R).
(3) The orbit is contained in an f-invariant open set $Z\subset I$, which is such that on each of its connected components f^n is monotone for each $n\geqq 0$. (A subset $A\subset I$ is called f-invariant if $f(A)\subset A$.)

In Section 2 it says: Let $f\in M(I)$, let $C_1, ..., C_r$ be the topologically transitive f-cycles and let $R_1, ..., R_m$ be the f-register-shifts. Then $A(f)=A(C_1,f)\cup...\cup A(C_r,f)\cup A(R_1,f)\cup...\cup A(R_m,f)\cup\cup Z(f)$ is a dense subset of I.

Section 7 to 12 discuss the structure of points $x\in I$ for which none of (1), (2), (3) holds. Some special results of real analysis necessary to understand the text are presented in Section 13 with proofs.

This book is an excellent counterexample to the proposition that texts proceeding at a relatively high level are necessarily hard to read.

L. Pintér (Szeged)

R. Remmert—P. Ullrich, Elementare Zahlentheorie, 275 pages, Birkhäuser Verlag, Basel—Boston, 1987.

This is a well-organized and well-written introduction to number theory.

The book consists of seven chapters. The first one deals with the prime factorization in Z and Q (in the sets of integers and rationals, respectively). Besides the basic facts we can read here on perfect numbers, Mersenne and Fermat primes, on the ancient Egyptian method of decomposition of fractions into unit fractions. The question of irrationality is also touched and Fourier's classical proof of the irrationality of e is presented.

The main subject of Chapter 2 is the highest common factor in Z, but it contains results on the distribution of prime numbers and on number theoretic functions.

Chapter 3 is a generalization of number theory to arbitrary integral domains. It starts with a summary of the basic definitions of rings, integral domains, quadratic number fields and proceeds with the divisibility theory in integral domains, factorization in Euclidean rings and concludes to the factorization in principal ideal domains.

Chapter 4 deals with the g-adic algorithm (the g-adic representation of numbers) including periodicity results of Euler and Fermat.

Chapter 5 contains the fundamental results on (number theoretic) congruences and residue class rings: the Fermat—Euler theorem (with an application in cryptography), theorem of Wilson, the Chinese remainder theorem, ideals in residue class rings, polynomial congruences.

Chapter 6 begins with the basic definitions of groups with number theoretic examples and the generalizations of the theorems of Fermat—Euler and Wilson. The second part of it deals with prime residue class groups: general criterions of cyclicity, the existence of primitive roots.

The final chapter is an introduction to the theory of quadratic residues: quadratic residues in general and modulo prime powers, Legendre-symbol, Gaus lemma and quadratic reciprocity (including an analytic proof of the Law of Quadratic Reciprocity due to Eisentein).

In several places there are exercises to help and controll the understanding of the previous material. We recommend this volume, which needs no prerequisite knowledge, for undergraduate courses as a basic textbook.

Lajos Klukovits (Szeged)

B. A. Rosenfeld, A history of Non-Euclidean Geometry. Evolution of the Concept of a Geometric Space (Translated by Abe Shenitzer with the Editorial Assistance of Hardy Grant) (Studies in the History of Mathematics and Physical Sciences, 12), IX+471 pages with 114 illustrations, Springer-Verlag, New York—Berlin—Heidelberg—London—Paris—Tokyo, 1988.

This English language edition of B. A. Rosenfeld's book is a considerable new work in the mathematical literature of English language on non-Euclidean geometries, their prehistories and significance in the history of mathematics.

The author's wide research work on the prehistory of hyperbolic geometry from the sixties has established the preparation of his fundamental book (see e.g. articles and monographs "*The algebraic treatise of al-Samaw'al*", "*On the astronomical treatises of al-Farghani*", "*Who was the author of the Roman edition of Nasir al-Din al-Tusi's Euclid's Elements?*", "*Omar Khayyam*", and also some studies on the historical questions, almost each of them is written in Russian).

The book is capable of revealing and presenting the evolution of basic concepts, first of all that of geometric space from the beginnings up to modern mathematics.

It is a great pleasure to the reader to find some new studies of the author in this new edition, such as "*The theory of parallels in the medieval East in* 9—14 *centuries*", co-author is A. P. Yuskevic). The essentially historical viewpoint of the author makes it possible that the mathematical and philosophical aspects do not be separated. In the Foreword he writes: "*...we investigate the mathematical and philosophical factors underlying the discovery of non-Euclidean geometry...*". That aim of the book is completely fulfilled so that it is worth reading for everybody who wants to study some questions of geometry in order to strengthen their philosophical knowledges.

Clearly arranged structure helps the orientation among the mass of citations, references, descripting and analytical parts. We can find as much formulae and demonstrations as necessary for the treatment (e.g. in Chapters 8 and 9 which are devoted to the "*Curvature of Space*" and "*Groups of transformations*", respectively). Notations are standard, however in the case of some important historical examples we inspect the original notations as well (e.g. Bolyai's notations). The same holds for the numerous nice figures in the book.

J. Kozma (Szeged)

P. Samuel, Projective Geometry (Translated from Geometrie projective, Press Universitaries De France, by Silvio Levy), (Undergraduate Texts in Mathematics), X+156 pages with 56 illustrations, Springer-Verlag, New York—Berlin—Heidelberg—London—Paris—Tokyo, 1988.

If the reader is an algebraist (or simply familiar with algebra) who has not met projective geometry yet, he or she may read this book from the first page to the last one as a pleasant essay, which gives outlook to some nice geometric problems. We only wanted to notice in this way that the important notions in projective spaces are built on such basements in this book which are essentially clear and algebraically strict.

On this base the classical results of projective geometry are developing while reading, on such a way that we do not need any further reference in order to interpret them. The beginning is very brief and clear: "Definition 1. Given a vector space E over a field K, the *projective space* associated with E is a set $P(E)$ of vector (lines) in E'', and this remains true to the last "Corollary. *The pedal of m with respect to a conic C is a line if and only if C is a parabola and m its focus.*" However, we have a short inspect the "Axiomatic Presentation of Projective and Affine Planes".

On the strength of all these P. Samuel's book is truly suitable for a subject of a starting course on projective geometry. The extent and the selected topics make the same purpose possible. The volume consists of four chapters. The subject of the first one extends to " The Pojective Space of Conics, and Projective Spaces of Divisors in Algebraic Geometry." Chapter 2 begins with the "Cross-ratios and Rational Maps". Further on discusses problems of harmonic division, projective transformations and involutions on projective lines, real projective structure of conics, unicursal curves, complex projective line and the circular group, and topology of projective spaces. Chapter 3 gives an elegant and short way of classification of conics and quadrics. In Chapter 4 the reader can find the treatment of the notion of polarity.

An appendix is devoted to the discussion of some results on (2,2)-correspondences.

The Bibliography at the end of the book is valuable help for readers to study the subject more circumstantially, with respect to its algebraic geometrical attitude.

J. Kozma (Szeged)

Erich W. Schmid—Gerhard Spitz—Wolfgang Lösch, Theoretical Physics on the Persona Computer, XII+211 pages, Springer-Verlag, Berlin—Heidelberg—New York—London—Paris—Tokyo, 1988.

Teaching physics had previously been characterised by the derivation of equations. Now it is possible to solve these equations for important realistic examples giving deeper understanding of the fundamentals of theoretical physics.

This book provides a basis for a lecture course on treating models, solving equations and presenting the numerical solutions by means of computers. The book includes the required software on floppy disk. The user-friendly programs are coded in FORTRAN 77 and can be easily installed on personal computers of the IBM PC/AT type.

Important instructions are given in the Introduction about the structure of the chapters and about the usage of the software. Four chapters are devoted to numerical methods and fourteen chapters concern problems in the fields of oscillations, celestial mechanics, electrostatics, real gases, heat conduction, water waves, solution of the radial Schrödinger equation, quantum mechanical oscillator, the ground state of the He atom and scattering of particles. Each of the fourteen chapters includes the formulation of the physical problem, an outline of the required numerical methods, the corresponding programs, exercises and answers to the exercises with examples of graphics outputs.

This book is recommended to lecturers and students of physics, applied mathematics and computer science.

I. Gyémánt (Szeged)

The Science of Fractal Images. Edited by H. O. Peitgen and D. Saupe, XV+312 pages, Springer-Verlag, New York—Berlin—Heidelberg—London—Paris—Tokyo, 1988.

The first impress of the reader about this book is that there are many figures and color plates in it (142 figures and 39 color plates) and its authors are the most famous mathematicians in the subject of fractal.

First of all Benoit Mandelbrot must be mentioned, who has a very important essay "Fractal, landscape without creases and with rivers" in this book and wrote the foreword.

Though the book is written by many mathematicians (Barnsley, Devaney, Fisher, Mandelbrot McGuire, Peitgen, Saupe, and Voss) it has a comprehensive concept: to bridge the gap between the mathematical foundations of fractal geometry and the computer generation of fractal images. In this sense it is a "how-to" book in which the basic algorithms are presented so that anyone who is familiar with elementary computer graphics should find no problem to get started. Since the book discusses fractals solely from the point of view of computer graphics disregard of the mathematical rigor is its advantage.

The book can be recommended to mathematicians, computer scientists, physicists as well as to the amateur mathematicians.

Árpád Kurusa (Szeged)

Philippe Tondeur, Foliations on Riemannian Manifolds (Universitext), XII+247 pages, Springer-Verlag, New York—Berlin—Heidelberg—London—Paris—Tokyo, 1988.

There is a great interest in the subject of foliations of Riemannian manifolds, but until now, as I know, there was no really good introductory book to this topic.

What can one expect for a good introductory book? First of all it must be written very clearly, must motivate the reader as much as possible, and must place its subject in the built of mathematics exactly. This book satisfies all these requests and in addition it is good reading. Furthermore it has a very big bibliography (about 60 pages!) to help the reader learning further. Being short but not too concise is the advantage of the book (there are many introductory book which grasps too much).

The book can be divided into two parts. The first part (chapters 1—4) contains motivation, introduction, and precise definition of foliation. The second part investigates some outlining topic in the theory of foliations connected with the Riemannian geometry of the ambient manifold.

In sum we recommend this book especially to students and young mathematicians, but it is worth reading for everybody who wants to know what a foliation is.

Árpád Kurusa (Szeged)

Topology and Geometry—Rohlin Semminar, Edited by O. Ya. Viro (Lecture Notes in Mathematics, 1346), XI+581 pages, Springer-Verlag, Berlin Heidelberg New York London Paris Tokyo, 1988.

This volume is dedicated to the memory of V. A. Rohlin (1919—1984) — an outstanding mathematician and the founder of Leningrad topological school. The editor's aim was to collect survey and research papers which reflect the character of the V. A. Rohlin Topological Seminar. The book is divided into four parts, the survey papers, the topology of manifolds, the theory of algebraic varieties, the topology of configuartion spaces. From the contents: V. I. Arnold, On some problems in symplectic topology; B. L. Feigin, D. B. Fuchs, V. S. Retakh, Massey operations in the cohomology of the infinite dimensional Lie algebra L_1; A. T. Fomenko, Invariant portrait of Hamiltonian integrable in Liouville sense; S. P. Novikov, An alytical theory of homotopy groups; Ya. B. Pesin, Ya. G. Sinai, On stable manifolds for class of two-dimensional diffeomorphisms; S.M. Finashin, M. Kreck, O. Ya. Viro, Non-diffeomorphic but homeomorphic knottings of surfaces in the 4-sphere; N. V. Ivanov, Automorphisms of Teichmüller modular groups; V. G. Turaev, Towards the topological classification of geometric 3-manifolds; V. M. Kharlamov, O. Ya. Viro, Extensions of the Gudkov-Rohlin congruence, N. E. Mnev, The universality theorems on the classification problem of configuration varieties and convex polytopes varieties; A. M. Vershik, Topology of the convex polytopes' manifolds, the manifold of the projective configurations of a given combinatorial type and representations of lattices.

The papers in the last part contain a very interesting application of topology to the combinatorics of convex polytopes. A. M. Vershik defined the space of a given convex polytope as the factor space of $C(P)$ under the action of the affine group, where $C(P)$ is the set of polytopes which are combinatorially equvivalent to P. This very natural and useful notion made it possible for them to apply the deep and strong methods of topology for studying the combinatorial structure of convex polytopes.

The volume is recommended to researchers in topology but some parts of it may be useful to everybody interested in the application of topology.

J. Kincses (Szeged)

A. C. Zaanen, Continuity, Integration and Fourier Theory (Universitext), VI+248 pages, Springer-Verlag, Berlin—Heidelberg—New York—London—Paris—Tokyo, 1989.

This book is a very good textbook for graduate or advanced undergraduate students in mathematics and mathematical physics.

The book consists of four parts. The first one (three chapters) is devoted to a discussion of simple properties of (real or complex) continuous functions on k-dimensional space, followed by the theorems of Korovkin and Stone—Weierstrass. The third chapter contains the elementary theory of Fourier series of continuous functions. In the second part (two chapters) the author deals with integration and with L_p-spaces. Convolutions and approximate identities in these spaces receive appropriate attention in view of their importance for what follows. The third part consists of two chapters dealing with Fourier series of Lebesgue summable functions and with the Fourier transform. The emphasis is on convergence. The space L_2 receives the special attention it deserves. In the fourth part several applications are presented. Some of these are of a somewhat more advanced nature, such as those in the section on functions of analytic type and the one on the Hausdorff—Young theorem.

The book contains more than sixty excercises some with hints for the solution. Throughout the book familiarity with basic elementary facts in mathematical analysis and linear algebra is assumed.

This excellent book is warmly recommended both to instructors and students.

J. Németh (Szeged)