

# The Mathematical Heritage of HENRI POINCARÉ

Felix Browder, Editor

## PART 1

- §1. **Geometry**  
Shing-Shen Chern  
Jun-Ichi Igusa  
John Milnor  
Ngaiming Mok and Shing-Tung Yau  
Alan Weinstein
- §2. **Topology**  
J. Frank Adams  
William P. Thurston
- §3. **Riemann surfaces, discontinuous groups and Lie groups**  
Lipman Bers  
Wilfried Schmid  
Dennis Sullivan
- §4. **Several complex variables**  
Michael Beals, Charles Fefferman  
and Robert Grossman  
Phillip A. Griffiths  
Roger Penrose  
R. O. Wells, Jr.

## PART 2

- §5. **Topological methods in nonlinear problems**  
Raoul Bott  
Haïm Brezis  
Felix Browder  
L. Nirenberg
- §6. **Mechanics and dynamical systems**  
Jean Leray  
David Ruelle  
Steve Smale
- §7. **Ergodic theory and recurrence**  
Harry Furstenberg  
Y. Katznelson and D. Ornstein
- §8. **Historical material**  
P. S. Aleksandrov  
Henri Poincaré  
Jacques Hadamard  
Lettre de M. Pierre Boutroux à  
M. Mittag-Leffler  
Bibliography of Henri Poincaré  
Books and articles about Poincaré



## PROCEEDINGS OF SYMPOSIA IN PURE MATHEMATICS      Volume 39

PSPUM/39.1K: Part 1, x + 439 pages. List \$40, Institutional member \$30, Individual member \$20

PSPUM/39.2K: Part 2, vi + 470 pages. List \$40, Institutional member \$30, Individual member \$20

PSPUM/39K: Two volume set. List \$75, Institutional member \$56, Individual member \$38

Prepayment is required for all AMS publications  
Order from AMS, PO Box 1571, Annex Station,  
Providence, RI 02901, or call 800-556-7774  
to charge with VISA or MasterCard.

## RECENT PUBLICATIONS

### REFERENCE WORK

#### MATHFILE User's Guide

Three chapters of the user's guide announced in the *Notices*, April 1982, page 300, will be sold separately. The entire guide, approximately 350 pages in loose-leaf format, is \$55 list price and \$41 for members. (To order the complete guide, please specify USERSGUIDE.)

#### Abbreviations of Journal Names (Chapter 3)

This list gives the form of references used in *Mathematical Reviews*. The abbreviation is followed by the complete title, the place of publication (and other pertinent information when required for clarity), the frequency of publication, the name and address of the publisher or distributor, and the date of the first journal issue reviewed by *Mathematical Reviews* (if 1976 or later). The International Standard Serial Number and CODEN are given when available, followed by the Library of Congress title for the journal. This chapter contains much more information than the journal abbreviation list sold in the catalogue of AMS publications.

MATHFILE User's Guide, Chapter 3  
1982, 91 pp., 3-hole punched, unbound  
List price \$13, member price \$13  
To order, please specify ABBREXPAN/K

#### Mathematics Classification Schemes (Chapter 4)

The classification system used in *Mathematical Reviews* has evolved over time. The material in MATHFILE 1973-1979 was indexed using a modification of the AMS (MOS) Subject Classification Scheme devised in 1970. Entries in MATHFILE 1980- are indexed using the 1980 Mathematics Subject Classification, a further modification of the earlier system.

Each column in the first portion of this chapter contains classification codes from the 1980 system, codes used in the cumulative index covering 1973 to 1979, verbal headings, and corresponding Library of Congress classification numbers.

The last few pages of the chapter show the Library of Congress classification numbers relevant to mathematics, together with the corresponding codes from the 1980 Mathematics Subject Classification.

MATHFILE User's Guide, Chapter 4  
1982, 47 pp., 3-hole punched, unbound  
List price \$9, member price \$9  
To order, please specify SUBJSEXPAN/K

#### Index of Subject Classification Words (Chapter 5)

This keyword in context index (KWIC) was constructed by taking all the mathematically significant words from the headings and subheadings of the 1980 Mathematics Subject Classification, as displayed in Chapter 4, and arranging them alphabetically. Next to each word is the classification in which the word occurs, followed by the name of the heading.

MATHFILE User's Guide, Chapter 5  
1982, 82 pp., 3-hole punched, unbound  
List price \$17, member price \$17  
To order, please specify SUBJWORDIND/K

### REFERENCE WORK

#### World Directory of Mathematicians 1982

The seventh edition of this directory, which is based on material supplied by the National Committees for Mathematics, is published by the Bureau of the World Directory of Mathematicians of the International Mathematical Union. Some of the national committees failed to offer new entries; in these cases the entries from the sixth edition have been used. The seventh edition contains a list of important mathematical organizations, an alphabetical list of mathematicians with addresses, and a geographical list. The AMS is distributing the directory.

World Directory of Mathematicians 1982  
Approximately 550 pages (soft cover)  
List price \$23, institutional member \$21,  
individual member \$21  
Publication date: November 1982  
To order, please specify WRLDIR/7K

This same book is available from other distributors:

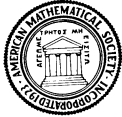
Prepaid orders from nonmembers in Japan should be sent to the Bureau of the WDM, International Mathematical Union, Department of Mathematics, Faculty of Science, Kyoto University, Kyoto 606, Japan: the price is ¥3,500.

Kinokuniya Book-store Co., Ltd., Shinjuku 3-chome 17-7, Shinjuku-ku, Tokyo 160-91, Japan, will accept orders (prepaid or not) for ¥5,000.

North-Holland Publishing Co., P. O. Box 103, 1000 AC Amsterdam, The Netherlands, will accept orders (prepaid or not) for U.S. \$32.50.

There is only one seventh edition, in soft-cover. Orders from any distributor are for exactly the same book.

Prepayment is required for all AMS publications. Order from AMS, P. O. Box 1571, Annex Station, Providence, RI 02901, or call toll free 800-556-7774 to charge with Visa or MasterCard.



## Singularities

Peter Orlik, Editor

PROCEEDINGS OF SYMPOSIA IN PURE MATHEMATICS, VOLUME 40

This book presents the proceedings of the Summer Institute on Singularities held at Humboldt State University, Arcata, California on July 20–August 7, 1981, and was prepared with partial support from the National Science Foundation.

The Theory of Singularities is a relatively new area of research which has grown rapidly and developed into a major field of activity. It employs the tools of Algebraic Geometry, Algebraic Topology, Differential Geometry and Real and Complex Analysis. The basic aim of these volumes is to give an exposition of the area, describe recent progress and list open problems. Some of the major topics are resolution and deformation of singularities in the algebraic and analytic categories; smoothing theory and mixed Hodge structures; equisingularity, the study of polar varieties and Whitney stratifications; Milnor fibration, monodromy and intersection pairing; analytic results, including the Gauss-Manin connection and relations with differential systems; metric properties and curvature; connections with knot theory and link theory, equivariant results and automorphic forms; unfoldings, adjacency, classification of singularities and modality; stability of singularities; Newton diagrams; Morse theory and intersection homology; and applications to physics and other sciences.

The expository papers introduce the reader to the frontiers of broad areas of research activity in singularities. The research articles solve specific problems and pose related open questions. In addition, two articles are devoted entirely to open problems in the area. Background necessary for understanding the papers is two years of graduate-level mathematics with advanced courses in Algebraic Topology, Algebraic Geometry, and Analysis.

The book's most significant contribution is its breadth. It encompasses the entire spectrum of research in singularities at this time. The field is very active and this is the first attempt at such comprehensive coverage.

Following is a list of contributors:

### PART 1

<i>Shreeram S. Abhyankar</i>	<i>Lawrence Brenton,</i>
<i>E. Akyildiz and</i>	<i>David Bindschadler,</i>
<i>J. B. Carrell</i>	<i>Daniel Drucker and</i>
<i>E. Akyildiz, J. B. Carrell,</i>	<i>Geert C. E. Prins</i>
<i>D. I. Lieberman and</i>	<i>E. Brieskorn</i>
<i>A. J. Sommese</i>	<i>S. A. Broughton</i>
<i>V. I. Arnold</i>	<i>J. W. Bruce, P. J. Giblin</i>
<i>Gottfried Barthel</i>	<i>and C. G. Gibson</i>
<i>(2 papers)</i>	<i>J. W. Bruce</i>
<i>Kurt Behnke</i>	<i>Ernesto Buzano and</i>
<i>Max Benson</i>	<i>Martin Golubitsky</i>
<i>M. S. Berger, P. T. Church</i>	<i>Antonio Campillo</i>
<i>and J. G. Timourian</i>	<i>Daniel S. Chess</i>
<i>Edward Bierstone and</i>	<i>P. T. Church</i>
<i>Pierre D. Milman</i>	<i>James Damon (3 papers)</i>
<i>Edward Bierstone and</i>	<i>A. Dimca and</i>
<i>Gerald W. Schwarz</i>	<i>C. G. Gibson</i>

*Igor V. Dolgachev*  
*Andrew Du Plessis*  
*Alan H. Durfee (2 papers)*  
*Wolfgang Ebeling*  
*David Eisenbud*  
*Fouad Elzein*  
*Robert Ephraim*  
*István Fáry (2 papers)*  
*Jonathan Fine*  
*Klaus Fischer*  
*Robert Friedman and*  
*Roy Smith*  
*Terence Gaffney*  
*(3 papers)*  
*Terence Gaffney and*  
*Leslie Wilson*  
*A. Galligo*  
*Yih-Nan Gau and*  
*Joseph Lipman*  
*Marc Giusti*  
*Norman Goldstein*

*Martin Golubitsky and*  
*David Schaeffer*  
*Mark Goresky and*  
*Robert MacPherson*  
*Gert-Martin Greuel*  
*and Joseph Steenbrink*  
*Helmut A. Hamm*  
*Robert M. Hardt*  
*Herwig Hauser*  
*J. P. G. Henry and*  
*M. Merle*  
*Audun Holme*  
*Anthony Iarrobino*  
*Franz W. Kamber and*  
*Philippe Tondeur*  
*Ulrich Karras*  
*H. King*  
*Toshitake Kohno*  
*Klaus Lamotke*  
*Rémi Langevin*

### PART 2

*Henry B. Laufer*  
*Lê Dũng Tráng and*  
*Zoghman Mebkhout*  
*Lê Dũng Tráng and*  
*B. Teissier (2 papers)*  
*Harm van der Lek*  
*Anatoly S. Libgober and*  
*John W. Wood*  
*A. Libgober*  
*Ben Lichtin (2 papers)*  
*Joseph Lipman*  
*Eduard Looijenga*  
*Ignacio Luengo*  
*Richard Mandelbaum*  
*John N. Mather*  
*Clint McCrory*  
*Isao Nakai*  
*Walter D. Neumann*  
*(2 papers)*  
*Matsuo Oka*  
*Peter Orlik and*  
*Louis Solomon*  
*Donal B. O'Shea*  
*Jürgen Pesselhoy*  
*and Oswald*  
*Riemenschneider*  
*Frédéric Pham*  
*Ragni Piene*  
*Henry C. Pinkham*  
*(2 papers)*

*Ian R. Porteous*  
*(2 papers)*  
*Fernando Puerta*  
*John D. Randall*  
*Richard Randell*  
*Felice Ronga (2 papers)*  
*C. Sabbah*  
*Kyoji Saito*  
*Morihiko Saito*  
*John Scherk*  
*José A. Seade*  
*Dirk Siersma*  
*Andrew John Sommese*  
*Robert Speiser*  
*J. H. M. Steenbrink*  
*David A. Stone*  
*Tatsuo Suwa*  
*Hiroaki Terao*  
*J. G. Timourian*  
*David Trotman*  
*Tohsuke Urabe*  
*Philip Wagreich*  
*Jonathan M. Wahl*  
*C. T. C. Wall*  
*Tamaki Yano*  
*Stephen S.-T. Yau*  
*Yosef Yomdin (2 papers)*  
*Steven Zucker*

1980 *Mathematics Subject Classifications*: 14, 16, 32, 53, 55, 57, 58

Proceedings of Symposia in Pure Mathematics  
 Volume 40: Parts 1 and 2 (hard cover)  
 xxvi + 676 pages (Part 1); xvi + 680 pages (Part 2)  
 Set: List price \$98, institutional member \$74,  
 individual member \$49  
 Each part: List price \$56, institutional member \$42,  
 individual member \$28  
 Set: ISBN 0-8218-1443-5; LC 83-2529  
 Part 1: ISBN 0-8218-1450-8; LC 83-2529  
 Part 2: ISBN 0-8218-1466-4; LC 83-2529  
 Publication date: July 1983  
 To order, please specify (Set) PSPUM/40 K  
 (Part 1) PSPUM/40.1K; (Part 2) PSPUM/40.2K

Prepayment is required for all AMS publications. Order from AMS, P.O. Box 1571, Annex Station, Providence, RI 02901, or call toll free 800-556-7774 to charge with Visa or MasterCard.



## PROCEEDINGS OF SYMPOSIA IN PURE MATHEMATICS

### Operator Algebras and Applications

Richard V. Kadison, Editor

These volumes present a state-of-the-art account of the theory of operator algebras and its applications. They stem from a conference that represented the first meeting dealing with the full range of the subject in over thirteen years. The major part of the volumes is expository in nature—the conference was arranged to survey advances and developments in recent years. Many articles have been written to give expository descriptions of these advances. There are groups of related articles (for example, in the theory of  $C^*$ -dynamical systems, the theory of unbounded derivations, applications to quantum physics, and the cohomology theory of operator algebras). There are major articles by many of the leading contributors to the field.

The Symposium was held at Queen's University, Kingston, Ontario, July 14–August 2, 1980. It was partially supported by a grant from the National Science Foundation.

Authors included in Part one are:

*R. J. Archbold*  
*William Arveson*  
*Paul Baum*  
*Ola Bratteli*  
*Lawrence G. Brown*  
*John W. Bunce*  
*Hisashi Choda*  
*Alain Connes*  
*Joachim Cuntz*  
*Ronald G. Douglas*  
*Edward G. Effros*  
*George A. Elliott*  
*Thierry Fack*  
*Masatoshi Fujii*  
*Elliot C. Gootman*  
*Phillip Green*  
*David Handelman*  
*Pierre de la Harpe*  
*Richard H. Herman*

*Richard V. Kadison*  
*A. Kishimoto*  
*E. Christopher Lance*  
*Henri Moscovici*  
*Dorte Olesen*  
*William L. Paschke*  
*Gert K. Pedersen*  
*Niels Vigand Pedersen*  
*L. Pukanszky*  
*Jean N. Renault*  
*Norbert Riedel*  
*Marc A. Rieffel*  
*Jonathan Rosenberg*  
*Claude Schochet*  
*Frederic W. Schultz*  
*Georges Skandalis*  
*Šerban Strătilă*  
*Hiroshi Takai*  
*Yasuo Watatani*

Authors included in Part two are:

*Charles A. Akemann*  
*Huzihiro Araki*

*C. J. K. Batty*  
*Horst Behncke*

*J. Bellissard*  
*Ola Bratteli*  
*Detlev Buchholz*  
*Man Duen Choi*  
*Erik Christensen*  
*Ph. Combe*  
*F. Combes*  
*Alain Connes*  
*Raul E. Curto*  
*Alfons van Daele*  
*Kenneth R. Davidson*  
*George A. Elliott*  
*G. G. Emch*  
*David E. Evans*  
*Klaus Fredenhagen*  
*Y. Friedman*  
*P. Ghez*  
*F. Goodman*  
*Rudolf Haag*  
*Harald Hanche-Olsen*  
*Richard H. Herman*  
*R. Hoegh-Krohn*  
*N. M. Hugenholtz*  
*B. Iochum*  
*B. E. Johnson*  
*V. F. R. Jones*  
*Palle E. T. Jørgensen*  
*Daniel Kastler*  
*W. P. C. King*  
*Burkhard Kummere*  
*Magnus B. Landstad*  
*R. Lima*  
*Roberto Longo*

*Calvin C. Moore*  
*Paul S. Muhly*  
*John Phillips*  
*Robert T. Powers*  
*Iain Raeburn*  
*Arlan Ramsay*  
*Jean N. Renault*  
*J. R. Ringrose*  
*John E. Roberts*  
*R. Rodriguez*  
*B. Russo*  
*Kazuyuki Saitō*  
*Shōichirō Sakai*  
*Norberto Salinas*  
*Geoffrey L. Sewell*  
*M. Sirugue*  
*M. Sirugue-Collin*  
*Christian F. Skau*  
*Erling Størmer*  
*Dennis Sullivan*  
*Colin E. Sutherland*  
*Hiroshi Takai*  
*Hideo Takemoto*  
*Masamichi Takesaki*  
*D. Testard*  
*Harald Upmeyer*  
*A. Verbeure*  
*Martin E. Walter*  
*Simon Wasserman*  
*E. J. Woods*  
*J. D. Maitland Wright*  
*László Zsidó*

1980 *Mathematics Subject Classifications*: 46L05, 46L10; 43A80, 81E05, 82A15.

Proceedings of Symposia in Pure Mathematics  
Volume 38: Parts 1 and 2 (hard cover)  
xix + 513 pages (Part 1); xv + 625 pages (Part 2)  
Set: List price \$80, institutional member \$60,  
individual member \$40  
Each part: List price \$46, institutional member \$35,  
individual member \$23  
Part 1: ISBN 0-8218-1441-9; LC 82-11561  
Part 2: ISBN 0-8218-1444-3; LC 82-11561  
Set: ISBN 0-8218-1445-1; LC 82-11561  
Publication date: September 1982  
To order, please specify (Set) PSPUM/38 K  
(Part 1) PSPUM/38.1K; (Part 2) PSPUM/38.2 K

Prepayment is required for all AMS publications. Order from AMS, P. O. Box 1571, Annex Station, Providence, RI 02901, or call toll free 800-556-7774 to charge with Visa or MasterCard.

## AMS SHORT COURSE LECTURE NOTES

A Subseries in Proceedings of Symposia in Applied Mathematics (ISSN 0160-7634)

### Statistical Data Analysis

Ram Gnanadesikan, Editor

This book is an outcome of the 1982 AMS Short Course given at Toronto. Statistical data analysis has been receiving a great deal of attention recently as evidenced by the fact that subsets of the authors of the present volume have given workshops or short courses on this topic at various meetings in the last two years, including those of the Mathematical Association of America and ICME-IV. The interest may be due to many things—practical importance of the topic, challenging research problems in a relatively young field, need for ideas and material for teaching courses on the subject.

Clearly neither the short course nor this book can provide enough details on all of the above facets of interest. However, the different chapters do address these aspects, although with varying degrees of emphasis. One hope of all the authors in publishing this book is that others will use this material as a starting point and, with the help of some of the references, be able to develop workshops, short courses and other educational forums on their own.

The authors are all employed by Bell Laboratories which provided support for the efforts of all of them.

### Contents

1. R. Gnanadesikan, *Introduction*
2. P. A. Tukey, *Graphical Methods*  
Introduction, Looking at a single collection of numbers, Comparing two or more sets of numbers, Exploring distributional models for data, Looking at relationships among variables, Plots for higher-dimensional data, Concluding remarks, Bibliography.
3. C. L. Mallows, *Robust Methods*  
Introduction, The regression problem, Estimation of location: I, Outliers, Estimation of location: II, Location and scale, Robust regression, Robust smoothing, Other areas, Bibliography.
4. J. B. Kruskal, *Multilinear Methods*  
Introduction, A basic bilinear model, The rotation problem, Restrictions used to aid comparison, Restrictions to find the true underlying factors, Singular value decomposition, Some more bilinear models, Trilinear models, An application, Appendix 1—Relationship among some models, Appendix 2—PARAFAC preprocessing, Bibliography.
5. J. R. Kettenring, *A Case Study in Data Analysis*  
Introduction, The data, Factor analysis and analysis of variance models, Factor Analysis results (Two-factor model, Residuals, A robust fit, Parallel factors, Size effects, Recapitulation), Analysis of variance results (Estimates of main effects and two-way interactions, Decompositions of the two-way interactions, Assessing the significance of the decompositions, Decomposition of the three-way interaction, Recapitulation), Summary, perspective, and critique, Acknowledgement, Bibliography.
6. R. Gnanadesikan, *Summary and Conclusions*  
Bibliography.

1980 *Mathematics Subject Classification*: 62-07

Proceedings of Symposia in Applied Mathematics  
Volume 28, x + 142 pages (hard cover and soft cover)  
Hard cover prices: List \$22, institutional member \$17,  
individual member \$11

Soft cover prices: List \$16, institutional member \$12,  
individual member \$8

ISBN 0-8218-0040-X; LC 82-24308

Publication date: April 1983

To order, please specify PSAPM/28K (hard cover)  
PSAPMS/28K (soft cover)

Prepayment is required for all AMS publications. Order from AMS, P. O. Box 1571, Annex Station, Providence, RI 02901, or call toll free 800-556-7774 to charge with Visa or MasterCard.



## CBMS REGIONAL CONFERENCE SERIES

(Supported by the National Science Foundation)

### Homology and Dynamical Systems

John M. Franks

This book is an exposition of a number of results dealing with the connections between algebraic topology and dynamical systems. For the most part proofs are included; where they are omitted a reference is given. The topics covered include: Morse gradients, symbolic dynamics and subshifts of finite type, Smale and Morse-Smale diffeomorphisms and flows, and the zeta function and homology zeta function of a diffeomorphism.

The book is intended for graduate students or researchers interested in the relationship between topology and dynamical systems. It is especially appropriate for persons with a background in topology who want to learn about dynamical systems. This book would be appropriate for a graduate level course. Except for an assumed background in algebraic topology the material is largely self-contained.

There are numerous books on algebraic topology and many on dynamical systems. This is the only book devoted to the inter-relationships of these two fields.

1980 *Mathematics Subject Classifications*: 58F09; 57R50

CBMS Regional Conference Series  
Number 49, vii + 120 pages (soft cover)  
List price \$14, individuals \$7  
ISBN 0-8218-1700-0; LC 82-8897  
Publication date: September 1982  
To order, please specify CBMS/49K

### Selected Topics in Harmonic Maps

James Eells and Luc Lemaire

The first part of this work is devoted to an account of various aspects of the theory of harmonic maps between Riemannian manifolds. In §1 the authors develop the formalism of Riemannian connections in vector bundles and the relevant calculus of vector bundle valued differential forms. That formalism is applied systematically in the sequel. §§2-7 give a rather full treatment of various topics. §§8 and 9 present certain aspects of the relationships between harmonic and holomorphic maps.

The primary aim of Part I is to present a coherent introduction to harmonic maps as a branch of geometric variational theory, and to illustrate their appearance as significant objects in Riemannian geometry.

In Part II the authors propose certain unsolved problems, together with comments and references. They range over the whole theory of harmonic maps, and are certainly of widely varying difficulty.

This book presents the first printed exposition of the qualitative aspects of harmonic maps.

#### Contents

#### Part I. Differential Geometric Aspects of Harmonic Maps

§§1. Operators on vector bundles, 2. Harmonic maps, 3. Some properties of harmonic maps, 4. Second variation of the energy, 5. Spheres and the behavior of the energy, 6. The stress-energy tensor, 7. Harmonic morphisms, 8. Holomorphic and harmonic maps between almost Kähler manifolds, 9. Properties of harmonic maps between Kähler manifolds.

#### Part II. Problems Relating to Harmonic Maps

§§1. Existence of harmonic maps, 2. Regularity problems, 3. Holomorphic and conformal maps, 4. Construction/classification of harmonic maps, 5. Properties of harmonic maps, 6. Spaces of maps, 7. Noncompact domains, 8. Variations on a theme.

1980 *Mathematics Subject Classifications*: 58E20; 32H99, 49F99, 53C05, 58A10, others.

CBMS Regional Conference Series  
Number 50, vi + 86 pages (soft cover)  
List price \$16, individuals \$8  
ISBN 0-8218-0700-5; LC 82-25526  
Publication date: May 1983  
To order, please specify CBMS/50K

Prepayment is required for all AMS publications. Order from AMS, P.O. Box 1571, Annex Station, Providence, RI 02901, or call toll free 800-556-7774 to charge with Visa or MasterCard.

<b>Aurel J. Zajta</b> , Solutions of the Diophantine Equation $A^4 + B^4 = C^4 + D^4$ ...	635
<b>Wilfrid Keller</b> , Factors of Fermat Numbers and Large Primes of the Form $k \cdot 2^n + 1$ .....	661
<b>Jean Lagrange</b> , Sets of $n$ Squares of Which Any $n-1$ Have Their Sum Square	675
<b>L. Alayne Parson</b> , A Lower Bound for the Norm of the Theta Operator .....	683
<b>Thorkil Naur</b> , New Integer Factorizations .....	687
<b>Paul A. Pritchard</b> , Eighteen Primes in Arithmetic Progression .....	697
<b>Leonard M. Adleman and Andrew M. Odlyzko</b> , Irreducibility Testing and Factorization of Polynomials.....	699
<b>H. Cohn and J. C. Lagarias</b> , On the Existence of Fields Governing the 2-Invariants of the Classgroup of $\mathbf{Q}(\sqrt{dp})$ as $p$ Varies .....	711
<b>Andrew Bremner and Nicholas Tzanakis</b> , Integer Points on $y^2 = x^3 - 7x + 10$	731
<b>D. H. Lehmer and Emma Lehmer</b> , Cyclotomy with Short Periods.....	743
<b>J. van de Lune and H. J. J. te Riele</b> , On the Zeros of the Riemann Zeta Function in the Critical Strip. III .....	759
<b>Reviews and Descriptions of Tables and Books</b> .....	769
Miranker <b>15</b> , Lapidus and Pinder <b>16</b> , Ortega and Poole <b>17</b> , Whiteman, Editor <b>18</b> , Powell, Editor <b>19</b> , Glowinski and Lions, Editors <b>20</b> , Diaz y Diaz <b>21</b>	
<b>Table Errata</b> .....	775
Magnus, Oberhettinger and Soni <b>594</b> , Bateman Manuscript Project: Erdélyi, Magnus, Oberhettinger and Tricomi <b>595, 596, 597, 598, 599</b> , Abramowitz and Stegun, Editors <b>600</b> , Gradshteyn and Ryzhik <b>601</b> , Abramowitz and Stegun, Editors <b>602</b>	
<b>Indices to Volumes XL and XLI</b> .....	785

No microfiche supplement in this issue

# MATHEMATICS OF COMPUTATION

## TABLE OF CONTENTS

October 1983

<b>Eitan Tadmor</b> , The Unconditional Instability of Inflow-Dependent Boundary Conditions in Difference Approximations to Hyperbolic Systems .....	309
<b>Stanley Osher and Richard Sanders</b> , Numerical Approximations to Nonlinear Conservation Laws with Locally Varying Time and Space Grids .....	321
<b>R. E. White</b> , A Modified Finite Difference Scheme for the Stefan Problem ..	337
<b>Douglas N. Arnold and Wolfgang L. Wendland</b> , On the Asymptotic Convergence of Collocation Methods .....	349
<b>Douglas N. Arnold</b> , A Spline-Trigonometric Galerkin Method and an Exponentially Convergent Boundary Integral Method .....	383
<b>J. Pitkäranta and R. Stenberg</b> , Analysis of Some Mixed Finite Element Methods for Plane Elasticity Equations .....	399
<b>Miloš Zlámal</b> , A Linear Scheme for the Numerical Solution of Nonlinear Quasistationary Magnetic Fields.....	425
<b>Jim Douglas, Jr. and Jean E. Roberts</b> , Numerical Methods for a Model for Compressible Miscible Displacement in Porous Media.....	441
<b>Luciano Galeone</b> , The Use of Positive Matrices for the Analysis of the Large Time Behavior of the Numerical Solution of Reaction-Diffusion Systems	461
<b>H. D. Mittelman</b> , An Efficient Algorithm for Bifurcation Problems of Variational Inequalities.....	473
<b>Robert E. Scheid, Jr.</b> , The Accurate Numerical Solution of Highly Oscillatory Ordinary Differential Equations .....	487
<b>Theodore S. Papatheodorou</b> , Block AOR Iteration for Nonsymmetric Matrices	511
<b>T. J. Ypma</b> , Local Convergence of Difference Newton-Like Methods .....	527
<b>Takemitsu Hasegawa, Tatsuo Torii and Ichizo Ninomiya</b> , Generalized Chebyshev Interpolation and Its Application to Automatic Quadrature .....	537
<b>Vittorio Massidda</b> , Analytical Calculation of a Class of Integrals Containing Exponential and Trigonometric Functions .....	555
<b>Ralph Baker Kearfott</b> , A Sinc Approximation for the Indefinite Integral.....	559
<b>J. Ernest Wilkins, Jr. and Theodore R. Hatcher</b> , The Maximum of a Quasi-Smooth Function.....	573
<b>Richard F. King</b> , Anderson-Björck for Linear Sequences .....	591
<b>Andrés Cruz and Javier Sesma</b> , Modulus and Phase of the Reduced Logarithmic Derivative of the Hankel Function.....	597
<b>D. Kershaw</b> , Some Extensions of W. Gautschi's Inequalities for the Gamma Function .....	607
<b>Shigehiko Okui</b> , Some Integrals Relating to the $I_e$ -Function .....	613
<b>N. C. Albertsen, G. Jacobsen and S. B. Sørensen</b> , Nonlinear Transformations for Accelerating the Convergence of $M$ -Dimensional Series.....	623