Analytic Functions of One Complex Variable
Titles in This Series

Volume

1 Markov random fields and their applications, Ross Kindermann and J. Laurie Snell

2 Proceedings of the conference on integration, topology, and geometry in linear spaces, William H. Graves, Editor

3 The closed graph and P-closed graph properties in general topology, T. R. Hamlett and L. L. Herrington

4 Problems of elastic stability and vibrations, Vadim Komkov, Editor

5 Rational constructions of modules for simple Lie algebras, George B. Seligman

6 Umbral calculus and Hopf algebras, Robert Morris, Editor

7 Complex contour integral representation of cardinal spline functions, Walter Schempp

8 Ordered fields and real algebraic geometry, D. W. Dubois and T. Recio, Editors

9 Papers in algebra, analysis and statistics, R. Lidl, Editor

10 Operator algebras and K-theory, Ronald G. Douglas and Claude Schochet, Editors

11 Plane ellipticity and related problems, Robert P. Gilbert, Editor

12 Symposium on algebraic topology in honor of José Adem, Samuel Gitler, Editor

13 Algebraists’ homage: Papers in ring theory and related topics, S. A. Amitsur, D. J. Saltman, and G. B. Seligman, Editors

14 Lectures on Nielsen fixed point theory, Boju Jiang

15 Advanced analytic number theory. Part I: Ramification theoretic methods, Carlos J. Moreno

16 Complex representations of GL(2, K) for finite fields K, Ilya Piatetski-Shapiro

17 Nonlinear partial differential equations, Joel A. Smoller, Editor

18 Fixed points and nonexpansive mappings, Robert C. Sine, Editor

19 Proceedings of the Northwestern homotopy theory conference, Haynes R. Miller and Stewart B. Priddy, Editors

20 Low dimensional topology, Samuel J. Lomonaco, Jr., Editor

21 Topological methods in nonlinear functional analysis, S. P. Singh, S. Thomeier, and B. Watson, Editors

22 Factorizations of $b^n \pm 1$, $b = 2, 3, 5, 6, 7, 10, 11, 12$ up to high powers, John Brillhart, D. H. Lehmer, J. L. Selfridge, Bryant Tuckerman, and S. S. Wagstaff, Jr.

23 Chapter 9 of Ramanujan’s second notebook—Infinite series identities, transformations, and evaluations, Bruce C. Berndt and Padmini T. Joshi

24 Central extensions, Galois groups, and ideal class groups of number fields, A. Fröhlich

25 Value distribution theory and its applications, Chung-Chun Yang, Editor

26 Conference in modern analysis and probability, Richard Beals, Anatole Beck, Alexandra Bellow, and Arshag Hajian, Editors
Titles in This Series

Volume

27 Microlocal analysis, M. Salah Baouendi, Richard Beals, and Linda Preiss Rothschild, Editors

28 Fluids and plasmas: geometry and dynamics, Jerrold E. Marsden, Editor

29 Automated theorem proving, W. W. Bledsoe and Donald Loveland, Editors

30 Mathematical applications of category theory, J. W. Gray, Editor

31 Axiomatic set theory, James E. Baumgartner, Donald A. Martin, and Saharon Shelah, Editors

32 Proceedings of the conference on Banach algebras and several complex variables, F. Greenleaf and D. Gulick, Editors

33 Contributions to group theory, Kenneth I. Appel, John G. Ratcliffe, and Paul E. Schupp, Editors

34 Combinatorics and algebra, Curtis Greene, Editor

35 Four-manifold theory, Cameron Gordon and Robion Kirby, Editors

36 Group actions on manifolds, Reinhard Schultz, Editor

37 Conference on algebraic topology in honor of Peter Hilton, Renzo Piccinini and Denis Sjerve, Editors

38 Topics in complex analysis, Dorothy Browne Shaffer, Editor

39 Errett Bishop: Reflections on him and his research, Murray Rosenblatt, Editor

40 Integral bases for affine Lie algebras and their universal enveloping algebras, David Mitzman

41 Particle systems, random media and large deviations, Richard Durrett, Editor

42 Classical real analysis, Daniel Waterman, Editor

43 Group actions on rings, Susan Montgomery, Editor

44 Combinatorial methods in topology and algebraic geometry, John R. Harper and Richard Mandelbaum, Editors

45 Finite groups–coming of age, John McKay, Editor

46 Structure of the standard modules for the affine Lie algebra $A_1^{(1)}$, James Lepowsky and Mirko Primc


48 Analytic functions of one complex variable, Chung-chun Yang and Chi-tai Chuang, Editors

49 Complex differential geometry and nonlinear differential equations, Yum-Tong Siu, Editor

50 Random matrices and their applications, Joel E. Cohen, Harry Kesten, and Charles M. Newman, Editors
CONTENTS

PREFACE vii

CONTRIBUTORS TO THIS VOLUME ix

ON THE INVERSION OF A LINEAR DIFFERENTIAL POLYNOMIAL 1
Chi-tai Chuang

DISTRIBUTION OF THE VALUES OF MEROMORPHIC FUNCTIONS 21
Chi-tai Chuang and Lo Yang

A SIMPLE PROOF OF A THEOREM OF FATOU ON THE ITERATION 65
AND FIX-POINTS OF TRANSCENDENTAL ENTIRE FUNCTIONS
Chi-tai Chuang

ALGEBROID FUNCTIONS AND THEIR APPLICATIONS TO 71
ORDINARY DIFFERENTIAL EQUATIONS
Yu-zan He

SUMMARY OF RECENT RESEARCH ACCOMPLISHMENTS IN 85
VALUE DISTRIBUTION THEORY AT EAST CHINA NORMAL UNIVERSITY
Rui-fu Lee, Chong-ji Dai, and Guo-dong Song

UNIVALENT FUNCTIONS 101
Shu-qi Liu and Chi-tai Chuang

QUASICOMFORMAL MAPPINGS 129
Cheng-qi He and Zhong Li

RIEMANN SURFACES 151
Ming-yong Zhang

APPROXIMATION AND INTERPOLATION IN THE COMPLEX DOMAIN 157
Xi-chang Shen

DIRICHLET SERIES 201
Chia-yung Yu

APPLICATION OF COMPLEX ANALYSIS TO NONLINEAR 217
ELLiptic systems of partial differential EQUATIONS
Guo-chun Wen

RIEMANN ZETA-FUNCTION 235
Nan-yue Zhang and Shun-yan Zhang

APPLICATION OF THE THEORY OF FUNCTIONS OF A COMPLEX VARIABLE 243
TO CELESTIAL MECHANICS
Zhao-hua Yi

COMPLEX VARIABLE METHODS IN ELASTICITY 247
Jian-Ke Lu
PREFACE

In the past, Chinese scholars had won brilliant accomplishments with inventions and creations in the evolution of science and technology, and particularly, made significant contributions in earlier development of mathematics.

Unfortunately, for about two decades, before and during the disruptive cultural revolution, the Chinese scientific community as a whole had been alienated from the western world and publication of works by Chinese scientists was very much discouraged.

Now, since the four modernization plans, China has reopened her doors and has rapidly taken the path to scientific and cultural interactions with the rest of the world.

As mathematicians, we have planned to edit a series of mathematical monographs in various fields of mathematics: Complex Analysis, Harmonic Analysis, Functional Analysis, Differential and Integral Equations, Algebra, Topology and Differential Geometry, Number Theory, Numerical Analysis, and Applied Mathematics.

It is hoped that these collections will not only reflect the achievements and contributions of Chinese Mathematicians in the development of contemporary mathematics, but, more importantly, provide a broad view of the scope of and aid greatly those interested in keeping abreast of developments in mathematical research in modern China for the past three decades. Furthermore, we hope the publication of these volumes will further promote the scientific exchanges between West and East, and become a trigger for similar projects in other scientific disciplines.

Thus, the nature of the articles solicited are mostly expository and survey types and written by contemporary distinguished Chinese mathematicians in their respective fields. The theme presented in this volume is focused on complex analysis of one variable, which is a well developed field in China.
In presenting this first volume to the reader, we wish to thank the American Mathematical Society for their support and endorsement in such an endeavor; which also made this difficult task an enjoyable and rewarding experience.

Finally, allow us in the name of the Editors to express our heartfelt thanks and appreciation to all the contributors who have kindly prepared and sent us their articles toward the completion of this book.

Chung-chun Yang 楊重駿
Chi-tai Chuang 庄圻泰
CONTRIBUTORS TO THIS VOLUME

Chi-tai Chuang  庄圻泰
The department of Mathematics, Peking University, Beijing, China

Chong-ji Dai  戴崇基
The Department of Mathematics, East China Normal University
Shanghai, China

Cheng-qi He  何成奇
The Department of Mathematics, Fudan University, Shanghai, China

Yu-zan He  何育贤
Institute of Mathematics, Academia Sinica, Beijing, China

Rui-fu Lee  李锐夫
The Department of Mathematics, East China Normal University
Shanghai, China

Zhong Li  李忠
The Department of Mathematics, Peking University, Beijing, China

Shu-qi Liu  刘书琴
The Department of Mathematics, Xian University, Xian, China

Jian-ke Lu  路见可
The Department of Mathematics, Wuhan University, Wuhan, China

Xi-chang Shen  沈增昌
The Department of Mathematics, Peking University, Beijing, China

Guo-dong Song  宋国栋
The Department of Mathematics, East China Normal University
Shanghai, China

Guo-chun Wen  闻国椿
The Department of Mathematics, Peking University, Beijing, China

Lo Yang (or Le Yang)  梁乐
Institute of Mathematics, Academia Sinica, Beijing, China

Zhao-hua Yi  易照华
The Department of Astronomy, Nanjing University, Nanjing, China

Chia-yung Yu  余家荣
The Department of Mathematics, Wuhan University, Wuhan, China
CONTRIBUTORS TO THIS VOLUME

Ming-yong Zhang 张鸣镛
The Department of Mathematics, Xiamen University, Xiamen, China

Nan-yue Zhang 张南岳
The Department of Mathematics, Peking University, Beijing, China

Shun-yan Zhang 张顺燕
The Department of Mathematics, Peking University, Beijing, China