

## Preface

We are pleased to present this volume of selected works in celebration of the 90th birthday of Professor Kai Lai Chung.

Kai Lai Chung was born in 1917 in Shanghai, China. His family home though was in Hangzhou in Zhejiang Province. He entered Tsinghua University in 1936 and first studied physics but graduated in mathematics in 1940. During the war with Japan, major universities in the Beijing-Tianjin region moved to the southwest city of Kunming and regrouped as the National Southwestern Associated University and Chung worked there in a position analogous to that of assistant professor. During this period, he first studied number theory with Lo-Keng Hua and then probability theory with Pao-Lu Hsu. In 1944, Kai Lai Chung won a highly competitive Boxer Rebellion Indemnity scholarship for study in the United States and he arrived at Princeton University in December, 1945. He completed his Ph.D. at Princeton in 1947 with Harold Cramér as advisor (Cramér was visiting Princeton at the time — S. Wilks and J. Tukey were the other members of the dissertation committee). Chung's thesis was entitled "On the maximum partial sum of sequences of independent random variables". Kai Lai Chung subsequently held academic appointments at the University of Chicago, Columbia University, University of California at Berkeley, Cornell University and Syracuse University. He moved to Stanford University in 1961 and is currently emeritus Professor of Mathematics at Stanford. Over the years, he held extended visiting appointments at several institutions: University of Strasbourg (France), University of Pisa (Italy), and the ETH (Eidgenössische Technische Hochschule) of Zurich (Switzerland). He held the George A. Miller Visiting Professorship at the University of Illinois at Urbana-Champaign in 1970-71.

Kai Lai Chung taught probability for over 30 years and supervised 14 Ph.D. students. The Mathematics Genealogy project currently lists a total of 112 academic descendants for him. The Ph.D. students (in chronological order) were as follows: Warren Hirsch, Rafael Chacon, William Pruitt, Norman Pullman, Naresh Jain, Arthur Pittenger, Robert Smythe, Michael Chamberlain, Christopher Nevison, Michael Steele, Ruth Williams, Elton Hsu, Ming Liao, Vassilis Papanicolaou.

This volume contains a selection of Kai Lai Chung's extensive journal publications, which span a period of 70 years. The selection was made in consultation with him and is only a subset of the many contributions that he made throughout his prolific career. Another volume, *Chance and Choice*, published by World Scientific in 2004, contains yet another subset, with four articles in common with this volume. Kai Lai Chung's research contributions had a major influence on several areas in probability. Among his most significant works are those related to sums of independent random variables, Markov chains, time reversal of Markov processes, probabilistic potential theory, Brownian excursions, and gauge theorems for the Schrödinger equation. We have included commentary articles by Naresh Jain, Ronald Gettoor, Ruth Williams and Michael Cranston elaborating on Kai Lai Chung's contributions in these areas and on the further developments that they spawned.

In 1981, Kai Lai Chung, along with Ronald Gettoor and Erhan Çinlar, initiated the "Seminars on Stochastic Processes". These conferences, with their innovative structure of just a few formal talks, allowing plenty of time for informal discussions and research problem sessions, continue as highly successful annual meetings to this day. We are pleased to include here several of Kai Lai Chung's articles from proceedings volumes for the "Seminar", published by Birkhäuser. In addition to his research articles, Kai Lai Chung's eleven books have influenced generations of students of probability, both graduate and undergraduate. He is well known for his clear, precise and entertaining style.

Kai Lai Chung played an influential role in the development of probability theory in his native China immediately after the chaotic years of the Cultural Revolution (1966-1976). His visit to China in 1978 (together with J. L. Doob and J. Neveu) was the starting point for renewed contact of Chinese probabilists with the West. He has visited China many times since then, given numerous lectures and short courses, and helped young Chinese students gain opportunities to study in the United States.

We thank Naresh Jain, Ronald Gettoor and Michael Cranston for contributing commentary articles for this volume. We are indebted to Erhan Çinlar, Rafe Mazzeo and Renming Song for their help in providing biographical information and to Louis Chen and Tze Leung Lai for their assistance in making connection with World Scientific. We are grateful to the various publishers for permission to reprint the articles that are included here, and also to Yubing Zhai and Ji Zhang of World Scientific for assistance in preparing this volume. We also wish to thank Lilia and Marilda Chung for providing a photograph of Kai Lai. Finally, we express our thanks to Kai Lai for his inspiration and guidance, and his many engaging conversations and stimulating questions over the years.

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