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## Foreword

Kuang-Chao Chou (Guang-Zhao Zhou) is a world-renowned theoretical physicist. Before I met him in the early nineteen seventies, I have already known his many significant research contributions for more than a decade from the late nineteen fifties. His published papers have won uniformly high praises by the international scientific community and his articles are always written with depth and elegance.

Kuang-Chao was the originator of the helicity amplitude analysis. That concept was introduced by him in 1957, followed by a full mathematical analysis of this very effective tool to his work in high energy physics research. In 1959, he perfected an important theorem in T and P violations, which states that under CPT invariance, while T reflection is not conserved, the decay branching ratios of particle and anti-particle to different states can be different even though their total decay widths are the same. In addition to his work on resonances, Kuang-Chao also pioneered the use of nuclear absorption to detect the weak magnetism in weak interactions, as well as a large body of theoretical analysis on the important photo-nuclear reactions through the use of dispersion theory. In 1960, Kuang-Chao analytically demonstrated the partial conservation of axial current (PCAC), which has been regarded as one of the cornerstones in particle physics. For this fundamental contribution, he was recognized internationally as one of the founding fathers of PCAC.

In the nineteen eighties after the Cultural Revolution, under the organization and guidance by Kuang-Chao, the younger generation of Chinese scientists were able to make many significant research works on grand unification theory, CP violation, non-linear sigma model effective Lagrangian theory, spontaneous symmetry breaking in super-symmetry, topological aspects of quantum field theory and its relation to anomaly. Many of these results (for example in topological aspects of quantum field theory and its relation to anomaly) have already attracted recognition from the international as well as Chinese physics communities. In statistical physics and condensed matter physics, the research group directed by Kuang-Chao systemized the Green's function formalism in non-equilibrium statistical mechanics. Their method was applied to the studies of laser, plasma, critical dynamics, random quenching, etc.

In addition to the remarkable achievement made by Kuang-Chao in many fields of theoretical physics, he has been one of the most important scientists in the development of science and technology in China and to the promotion of the international science exchange and cooperation. Kuang-Chao Chou served as the director of Institute of Theoretical Physics at the Chinese Academy of Sciences, the Dean of the Science School of Tsinghua University, the President of Chinese Academy of Sciences, the Chairman of the China Association for Science and Technology, the Executive Vice-President of China Commission for Promoting International Science and Technology and the vice Chairman of China Association for Peace and Disarmament. He is an Academician of the Chinese Academy of Sciences and has also been elected as Foreign Associate of the US National Academy of Sciences, Fellow of the Third World Academy of Science, and Foreign Member of USSR Academy of Sciences, and the European Academy of Arts, Sciences and Humanities.

T. D. Lee