Preface

Special Issue Dedicated to Professor Weiyi Su's 80th Birthday

This special issue is dedicated to Professor Weiyi Su for the celebration of her 80th birthday and for honoring her more than 50 years' research and education career in mathematics.

Professor Su was born in Yichang, Hubei Province, China in 1938. She joined the Department of Mathematics of Nanjing University (NJU) as an assistant professor after her five-year undergraduate study there from 1956 to1961. During the period of 1984-1988 she visited the University of New Mexico in USA. After returning to Nanjing University she was promoted to full professor in 1988, and then became a member of the PhD supervision faculty in 1992. She had been the Head of Mathematics Department of NJU and the Director of the Committee of Mathematics Popularization of Mathematical Society of Jiangsu Province from 1993 to1998. From 1999 to 2012 she had been also a vice-chairman of the Committee of Mathematics Popularization of the Mathematical Society. She taught advanced mathematics at Kuang Yaming Honors School, NJU for more than 18 years (1997-2015), even after her official retirement in 2008. As one of the early sponsors, Professor Su had served for a long time (1986-2015) as the Executive Editor of Analysis in Theory and Applications, which is partially sponsored by Mathematics Department of NJU.

Professor Su's major research topics are Fourier analysis and fractal analysis on local fields. From 1975 to 1990, in collaboration with Professor Weixing Zheng, who is also a leader of the group in abstract harmonic analysis and approximation theory in NJU, she obtained several results on Walsh analysis, including

- A construction of Abel-Poisson approximation operators and identity approximation kernels in Walsh system as well as their approximation theorems;

- A definition of p-adic logical derivatives on locally compact groups and proof of their various properties;

- Proofs of Jackson theorem, Bernstein theorem and equivalent theorem for Walsh system.

These contributions revealed solid connections between the Walsh analysis in harmonic analysis and the fractal analysis on local fields, and received much attention from researchers of various fields in the world.

After 1990, Professor Su's main research interest continued to concentrate in harmonic analysis and fractal analysis over local fields. Her main contributions in this period include the following:

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- A study of the distribution theory and function spaces theory, and the construction of Hölder-type spaces, Besov-type spaces, Triebel-Lizorkin spaces as well as fractal spaces on local fields;

- A definition of the Poisson-type approximation identity kernels and corresponding operators, and proof of approximation theorems on local fields;

- Introduction of a new calculus on local fields, the so-called "p-type calculus", and proof of certain essential properties, as well as comparisons with Newton calculus;

- Establishment of fractal analysis on local fields, such as fractal sets and their fractal measures and dimensions, evaluation of p-type derivatives of fractal functions, as well as establishment of a fundamental theory of "fractal PDEs".

In addition to these solid research results leading to more than 100 papers and three books, during her academic career Professor Su has been supported by 17 research grants from NSF of China, Ministry of Education of China and NSF of Jiangsu Province. She is also the advisor of more than 15 PhD students, 22 Master degree students and seven post-doctors. These scientific achievements have made her well-known as a serious analyst and an amiable supervisor in and outside China.

Professor Weiyi Su had taught in Nanjing University for more than fifty years. Her lectures include ones for undergraduate mathematics majors, such as mathematical analysis, advanced algebra, complex variable functions, real variable functions, functional analysis, Walsh analysis, wavelets theory and applications. She also lectured on modern analysis for graduate students in NJU for eight years. Moreover, her lectures on advanced mathematics and foundation of modern applied mathematics for the Department of Physics, Department of Astronomy and Kuang Yaming Honors School of NJU won a high reputation to her. As a highest honor, she was awarded the "Life Time Achievements of Education" by Nanjing University in 2015.

Professor Weiyi Su devotes all of her time to research and education of mathematics. Her concentration in research, enthusiasm in education and kindness to her students set herself as an exemplary model for us as a professor, a teacher and an advisor. We would like to take this opportunity to wish her happy 80th birthday and good health for many years to come!

Special Issue Editors:
Yongzhong Sun, Nanjing University
Huicheng Yin, Nanjing University
Ping Zhang, Chinese Academy of Sciences