CONGRATULATIONS TO ACADEMICIAN ZHOU YULIN ON HIS 80th BIRTHDAY

Editorial Committee of Journal of Computational Mathematics
Editorial Committee of Mathematica Numerica Sinica
Editorial Committee of Journal on Numerical Methods and Computer Applications
Editorial Committee of Chinese Journal of Numerical Mathematics and Applications

February 12, 2003 is the 80th birthday of Professor Zhou Yulin, an outstanding mathematician, academician of Chinese Academy of Sciences, an honorary member of the editorial board of our journals. We publish this special issue as our sincere congratulations to him.

Professor Zhou Yulin was born in Shanghai, with the ancestral home in Zhenhai, Zhejiang Province. He graduated from the Department of Mathematics at Datong

University in Shanghai in 1945 and then went on to study under the great mathematician S.S.Chern at the Institute of Mathematics of the Central Academy of Sciences in Nanking. In 1949, he made a resolute decision to go to the North and taught first at Tsinghua University and afterwards at Peking University. In 1954 he was chosen to pursue his advanced studies in Moscow University and there he majored himself in partial differential equations, which was more necessary in the motherland, under the guidance of the world famous mathematician O.A.Oleinik. He got his candidate doctor's degree of physical and mathematical sciences of U.S.S.R. in 1957. Upon returning to the homeland, he devoted himself to research and teaching. In 1960 he was summoned to participate in the theoretical research on nuclear weapon and has been working for the Institute of Applied Physics and Computational Mathematics in Beijing ever since.

Professor Zhou's academic attainments involve multiple fields such as topology, partial differential equations, computational mathematics, fluid dynamics and computer applications. His early work was centered on homology and homotopy theory in topology and he published a number of research papers. His remarkable achievements in this field and solid knowledge in topology greatly influenced his later research methods for nonlinear problems.

From the middle 1950's to the early 1960's, he obtained systematic and profound results for the equations of nonlinear elliptic and parabolic type, including regular and degenerate equations. His accomplishments particularly in the following three aspects are most influential.

1. His paper on the porous medium equations. This work was conducted collaboratively with Professor O.A.Oleinik and the others, which discussed in depth the existence, uniqueness and other properties of the weak solution and has been served as the framework by most of the scholars in this field in their research work all over the years. Until today the paper, hailed as pioneer and classical work, has been extensively cited by the researchers in the same field both home and abroad.

2. His research work on Neumann problems for quasilinear parabolic equations of second order. He created apriori estimates of the derivatives of solutions and the constructions of auxillary functions and proved the existence of global solutions in his paper, which is likewise frequently cited by scholars home and abroad.

3. His research on quasilinear degenerate elliptic equations of second order. He successively generalized the classical work on linear degenerate elliptic equation by U.S.S.R. mathematician M.V.Keldish to quasilinear equations. This work largely affected a number of domestic scholars and led to much follow-up work.

During the years of teaching at Peking University, Professor Zhou led and organized seminars on nonlinear partial differential equations, whose members were young scholars from all around the country. Professor Zhou fostered a number of excellent people for

the nation and at the same time, he developed the approach of apriori estimates and established the frame work for the research on nonlinear elliptic and parabolic problems. His academic idea has exerted far-flung influence on the research and development in this field. Professor Zhou is the pioneer and founder of the studies of the nonlinear partial differential equations in our country.

From the 1960's till the 1970's, Professor Zhou was the deputy director of the Institute of Applied Physics and Computational Mathematics in Beijing, in charge of the work concerning the numerical simulation of nuclear weapon and fluid dynamics. He organized a research team working on scientific computing, guiding and participating in the work of numerical simulation of various problems. Particularly he conducted intense and systematic research on different numerical methods from the perspective of mathematical theory and physical and dynamic profiles, and cultivated a number of key members of scientific computing. To meet the needs of massive scientific computing, he studied the mechanisms of roundoff error and deduced the proper matched relationship between the indexes of the speed, storage, word length of the large scale computers, and provided evidence for the reliability of applications, designs and development of computers. Professor Zhou has contributed much to the numerical simulations of nuclear weapon.

From the late 1970's till the 1980's, Professor Zhou engaged in the research on the nonlinear evolutionary systems of equations of very general type and made much achievements with distinguishing features. The systems of equations in his research work on the whole have strongly nonlinearity, degeneracy (or singularity) with practical background with the results inclined to be conditionally weak but profound in conclusion. The research on the system of ferro-magnetic chain of Landau-Lifshitz type is typical of such work, and aroused the interest of the scholars in the same field abroad.

From the 1980's to the 1990's, Professor Zhou made distinct and remarkable contribution to the research of numerical solutions to partial differential equations, namely, he initiated the method and theory of discrete funcational analysis. Professor Zhou revealed thoroughly the relationship among various norms, orders of difference quotient. Based on it, he systematically derived various formula of funcational interpolation, which provided effective research methods. Professor Zhou applied this approach to the systematic study on difference methods of general nonlinear evolutionary system of equations and set up relevant theory. Especially for the practical applications of the large scale scientific computing, he established the theory of finite difference methods with intrinsic parallelism. With the development of the constant extended application of large scale scientific computing and theoretical research, the method will definitely play a much bigger role.

In the 1980's, Professor Zhou was awarded one first prize, one third prize of National

Natural Science; one special prize for the Progress of National Science and Technology. In the 1990's, he was awarded the prize of He Liang-He Li Fund, Hua Luogeng Prize for Mathematics and two prizes for the Progress of Science and Technology on the commission level.

Professor Zhou has made extraordinary contributions to the national defense and the mathematical science.

Professor Zhou is a rigorous scholar, scrupulous, hardworking,absorbed in his pursuit of studies. In learning he is pondering and always strives for perfection. He is enthusiastic to the juniors in giving advice and tireless in teaching. In his way of getting along with people, he is candid and sincere, making a clear distinction between right and wrong, a model for scientists and technologists.

In 1992, Professor Zhou was elected the academician of Chinese Academy of Sciences. He was the chairman of the executive council of China Computational Mathematical Society, and now the honorary chairman of it.

On this special occasion of the 80th birthday of Professor Zhou, we extend our heartfelt wishes to him for a good health and a long life.