Professor Ding Xiaxi

THE ACADEMIC CAREER AND ACCOMPLISHMENTS OF PROFESSOR DING XIAXI

Dedicated to Professor Ding Xiaxi on the Occasion of His 70th Birthday

Born on May 25, 1928 in Yiyan of Hunan Province, Professor Ding Xiaxi graduated from the Mathematics Department of Wuhan University in 1951. He is now with the Institute of Applied Mathematics of CAS, as well as the Institute of Mathematics of Shantou University, after years of work in many institutes of CAS, including the Institute of Mathematics, the Institute of System Sciences, and the Wuhan Institute of Mathematical Physics (as the Head during 1985–94). He was promoted to research fellow in 1978 in the Institute of Mathematics of CAS, and elected as an academician of the Chinese Academy of Sciences in 1991. He was entitled the labor model of CAS in 1989, on the occassion of the 40th anniversary of the People's Republic.

Professor Ding has attributed systematically and creatively in numerous fields of mathematical sciences. His great contributions include nearly 100 publications, among which there are over 90 academical papers, 4 monographs, and 3 pop-scientific books. He is among the first generation of mathematicians brought up by the new China. As a promising young man, he was selected for further study in the Institute of Mathematics in 1951 after college years. In the newly established institute, he had the opportunity of working under the guidance of Professor Hua Luogeng. After 1953, he started the research on partial differential equations, supervised by the famous mathematician, Professor Wu Xinmou, and becomes now one of the most fruitful Chinese scholar in this field. His outstanding research work has won him reputation around the world. His broad interests cover the realms of partial differential equations, functional spaces, number theory, statistics, harmonic analysis, and numerical analysis, etc. Particularly, most of his efforts have been put on partial differential equation, and functional spaces, as described briefly as follows.

I) Partial Differential Equations

Professor Ding had studied mixed-type equations during 1954–55. In 1955, the new Republic had her first paper on partial differential equations by this young man: "Mixed-type Differential Equation". In the same year, in a joint paper with Professor Wu Xinmou. "On the Uniqueness for the Tricomi Problem", he proposed a method, called as "abcPQR" method afterwards. This work has been greatly concerned among mathematicians around the whole world. In the monograph "Mathematical Aspects of Subsonic and Transonic Gas Dynamics", the American academician L. Bers remarked this way on the uniqueness of Chaplygin equation: "For the abc method, the difficulties lie in choosing the functions a, b and c. The way proposed by Wu Xinmou and Ding Xiaxi, then developed by Protter, solved completely the uniqueness for the Tricomi equation." Moreover, Professor K.O. Friedrichs, another academician, cited and discussed a lot on this paper in his well-known work "Symmetric Positive Linear Differential Equation". As a matter of fact, the paper served as one motivation of the symmetric positive operator theory by Friedrichs. The paper had also been quoted by the Russian corresponding member A.B. Bitzache, M.M. Smilnov, and others in their books and papers.

Advised by Professor Wu Xinmou, Ding et al obtained in 1960 a sufficient and necessary condition for the uniqueness of the Dirichlet problem of an elliptic equation with constant coefficients. To some extent, this remains to be the best result up to now, and had been quoted in the Italian academician Miranda's classical book "On Elliptic Equations". Professor Hua Luogeng was attracted by this work and made some improvements and generalization with his students, leading to monographs in both Chinese and English.

After an extensive survey on the trends of the study on partial differential equations, Professor Ding and his group sticked on the important topic of discontinuous solution