

Wen-hua Zhou, Guo-yue Yang

Ji-shan He: a Brief Biography

Ji-shan He

Professor

Central South University

Professor Ji-shan He was born in Liuyang County, Hunan Province, China, in September 1934. He graduated from Changchun Institute of Geology in 1960, and became one of the first elected members of the Chinese Academy of Engineering (CAE) in 1994.

Professor Ji-shan He, who once served as president of Central South University of Technology, member of the presidium of CAE, director of the Division of Chinese Energy and Mining Engineering and vice-president of the Chinese Geophysical Society, has been devoting himself to scientific research for over 60 years. He is a lifelong member of the American Society of Exploration Geophysicists (ASEG).



Professor He, as a famous geophysicist, an educator, an engineering management theorist, and one of the scientists who epitomize the electromagnetic methods in China, has been making a long-term commitment on the theory and methodology of geophysics and the system of observing apparatuses. He created the Dual Frequency Induced Polarization (IP) method and invented the Dual Frequency IP instrument. He not just caught up with the closed addition in a three-element set, but also proposed the fast recursive coding of $2n$ Sequence Pseudo-Random Signal, and created the electrical system based on Pseudo-Random Signal as well. Moreover, he invented the Flow-Field method with high-resolution to detect the water inlet of the piping and seepage in dykes and dams, which provides the essential technical support and the scientific decision-making basis of emergency restoration for detecting the hidden dangers of dilapidated reservoirs and investigating the hazards of embankments in flood season. He unified the definition and algorithm of the entire field resistivity of the frequency domain electromagnetic methods, and created the Wide Field Electromagnetic method to open up a brand-new research area for the electromagnetic exploration. He also created in his area the first National Key Discipline of China, which features the geo-electric field and observation system. He has been involved in the geophysics research for a long time, making outstanding academic achievements.

The extraordinary achievements Professor He gained place China in a leading position in the world in the field of frequency domain electro-prospecting. There are experts pointing out that the worth of Dual-Frequency IP method, Wide Field Electromagnetic Method and metal mineral resources discovered is more than 230 billion RMB Yuan. H. F. Morrison, a famous American geophysicist, once wrote that Professor He's contributions to the geophysical sciences, especially in terms of IP and Controlled Source Audio-frequency Magneto Telluric (CSAMT), have been accepted and adored all over the world.

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Professor He has been paying ardent attention to the development of management science and engineering discipline, and engaging in the systematic research of the theory and practice of engineering management. He has been playing an important role in stimulating the academic activities of the Engineering Management Division of CAE, in motivating the engineering management forums and the construction of the engineering management discipline.

Professor He advocates integration of science, technology and engineering with art. Being a member of the Committee on Culture and Culturing Education of the Ministry of Education, a consultant of the Hunan Association for Calligraphers, he proposes calligraphy education for college and university students. He established himself as an excellent artist, not only with his extraordinary achievements in both calligraphy and couplet composition in Chinese, but also with his pioneering in integration of Chinese and English calligraphies.

Professor He, with his outstanding achievements, won a series of awards. He was given 5 national awards and 20 provincial and ministerial awards, including one National Scientific Conference Award, one National Invention Award and two National Science and Technology Progress Awards. In 1986, he was entitled with the Young and Mid-Aged Expert with Outstanding Contributions. In 1995, he was elected as the National Model Worker of the Non-ferrous Metallurgical Industry. In 2000, he was named as the National Advanced Educational Worker. Five years later, he was rated as the National Advanced Worker. In 2014, he won the Outstanding Contributions Award from Hunan Provincial Government.

He has published more than 100 papers and 8 monographs, and obtained 18 patents. He is the author of such books as *Dual-frequency IP Method* (Beijing: Higher Education Press, 2006), *Wide Field Electromagnetic Sounding Methods and Pseudo-Random Signal Coding Electrical Method* (Beijing: Higher Education Press, 2010), *Control Source Audio-Frequency Magnetotellurics* (Changsha: Central South University of Technology Press, 1990).

As a top expert in geophysics and engineering management, Professor He is deeply admired by many people because of his endeavors, his insistence, his profound knowledge, his creativity and his great enthusiasm for exploration. He exercises significant influences on the students and the younger professionals in and around his fields.