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In Celebration

Professor Zeng-Yuan Guo, Chinese Academician, on his 75th birthday

Professor Zeng-Yuan Guo, Chinese Academician and professor in the Department of Engineering Mechanics, School of Aerospace, Tsinghua University, Beijing, China, celebrates his 75th birthday this year. It is our great pleasure to offer our congratulations on his many contributions to the development of the field of heat transfer.

Professor Guo was born on 20 February 1936 in Jiangsu Province, China. He graduated from Tsinghua University in 1959. He has worked in Tsinghua University, Beijing, China ever since, a tenure of over 50 years. From 1979 to 1981, he worked as a Humboldt scholar in TU Muenchen, Germany.

Professor Guo's research has been mainly concerned with thermofluid mechanics, micro/nanoscale heat transfer, thermal system optimization and efficient thermal transport. He has always sought to find new ways to analyze heat transfer problems. For instance, he focused much attention on the adverse effects of heating on the flow in convective heat transfer processes, instead of the conventional view that just considers the impact of the flow on the heat transfer. He developed the concepts of thermal drag, thermal drive, thermal displacement, and thermal instability which were presented in his keynote lectures at the 8th and 9th International Heat Transfer Conferences and in a chapter on "Thermally Induced Effects on Fluid Flow" in the *Annual Review of Heat Transfer*, vol. 5, pp. 207–269, 1994. His achievements in this direction won him a 3rd Class National Natural Science award from the Chinese government in 1995.

Professor Guo's research is also related to the development of modern microelectronic technologies. Microscale and nanoscale heat transfer effects are key problems in this field. In his keynote lecture at the International Conference on Transport Phenomena at Microscale in Canada in 2000 and at the 12th International Heat Transfer Conferences in France in 2002, Professor Guo first revealed that the microscale heat transfer size effect on the flow and heat transfer correlations is attributed to the variation of the dominant factors, such as the flow compressibility, surface roughness, and axial conduction in the tube wall, as the scale decreases even though the continuum assumption is still applicable. He was awarded the ICMM 2005 Lifetime Contribution Award in the field of Heat and Mass Transfer due to his pioneering contributions through original research related to micro/nanoscale heat transfer. In particular, his contributions to our understanding of single-phase liquid flow in microchannels were noted as major contributions that have significantly impacted our understanding in this field.

In the last decade, Professor Guo has mainly focused his research of effective utilization of thermal energy. He proposed the field synergy principle for the optimization of convective heat transfer and introduced the physical quantity "entransy" to represent the physical nature of the field synergy principle, by analogy between thermal and electrical transport. The dissipation of entransy can be used to define the efficiencies of heat transfer processes and to establish the extremum principle of entransy dissipation for heat transfer optimization because it represents the irreversibility of heat transfer not related to heat-work conversions. He was the principle investigator on a National Basic Research Program of China project to investigate key scientific problems related to high efficiency energy conservation which won the 2nd National Science and Technology Progress Award of China in 2004.

In recent years, Professor Guo has focused his interest on the re-exploration of the nature of heat. He proposed the concept of "thermomass", using Einstein's relativity relationship between mass and energy and proposed a general heat conduction law that includes various heat conduction models, such as the Fourier model and *C–V* model as special cases.

Professor Guo is also a famous and respected educator in the thermal science field in China. He has supervised over 50 doctoral students and many masters students and has taught many undergraduate students. He has promoted significant international cooperation in the field of heat and mass transfer in many venues. He was an assembly member of the International Heat Transfer Conference and an executive committee member of the International Center for Heat and Mass Transfer.

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On behalf of Professor Guo's students, colleagues, and friends from around the world, including the editors of this journal, we wish him happiness, good health and continued success.

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