



HSIEN K. CHENG

1923–2007

Elected in 1988

“For original contributions to hypersonic flow theory and to the aerodynamics of three-dimensional wings in subsonic and transonic flows.”

BY DANIEL WEIHS

HSIEN KEI CHENG, Emeritus Distinguished Professor of Aerospace and Mechanical Engineering at the University of Southern California’s Viterbi School of Engineering, died in his sleep on July 11, 2007. He was 84.

Born in Macao, China, on June 13, 1923, Cheng received a bachelor of science degree in aeronautical engineering from Chiao Tung University in 1947. He continued his studies in aeronautical engineering at Cornell, where he earned a master of science degree (1950) and PhD (1952).

HK, as he was generally known, started his career working as a research aerodynamicist for Bell Aircraft Corp., where he gained invaluable experience in realizing theoretical concepts in aerodynamics. In 1959 he returned to Cornell Aeronautical Laboratory (now Calspan) to work as principal aerodynamicist, until 1963, when he moved to Stanford for a year as visiting professor. He then accepted a position as special lecturer in the Graduate Department of Aerospace Studies at the University of Southern California. The next year he was appointed full professor in USC’s Department of Aerospace Engineering, and stayed almost 30 years, until his retirement in 1994. He maintained close ties with USC and other colleagues long after.

Cheng was an early and major contributor to various areas of aerodynamics. In 1963 he published a groundbreaking

paper¹ on hypersonic flow that was crucial to the design of ultra-high-speed aircraft, an area now at the forefront of aeronautical science. His work was essential to the understanding of reentry phenomena including nonequilibrium gas dynamics.

He also made outstanding contributions to theories of three-dimensional wings in subsonic and transonic flows, including slender wings and bodies and the leading-edge vortex phenomena of swept and delta wings. Other areas in which he published significant work were theoretical and computational fluid mechanics, geophysical fluid mechanics, interaction of sonic booms on seas, biofluid dynamics, and the hydrodynamics of swimming propulsion.

Cheng's pathbreaking contributions were recognized by his election as an NAE member and a fellow of the American Institute of Aeronautics and Astronautics. He received the USC Viterbi School's Engineering Faculty Research Award in 1984 and was a member of the Phi Tau Phi Honorary Scholastic Society. In 2007 the USC Viterbi School's Astronautics and Space Technology Division named its annual keynote lecture in his honor.

Everyone knew HK as a warm, outgoing person, who gave freely of his immense store of knowledge, time, and mathematical intuition.

Cheng was survived by his wife, Wai L. Cheng, and daughter Linda Cheng.

¹ Cheng HK. 1963. *The Blunt-Body Problem in Hypersonic Flow at Low Reynolds Number*. Cornell Aeronautical Laboratory Report No. AF-1285-A-10.

