



*Chy. Lin Tien*

## CHANG-LIN TIEN

1935–2002

Elected in 1976

*“For contributions to the theory of heat transfer and for its application to difficult contemporary engineering problems.”*

BY ERNEST S. KUH AND RALPH GREIF

CHANG-LIN TIEN, a world leader in heat transfer and thermodynamics, died in Hillsborough, California, on October 29, 2002, at the age of 67. He was a creative researcher, a master teacher, and, above all, a distinguished and enthusiastic educator and leader.

Born in Wuhan, China, on July 24, 1935, Chang-Lin was a high school student in Shanghai when he followed his family to Taiwan in 1949 to escape civil war in China. He received his B.S. degree from National Taiwan University in 1955. After one year of military service, he came to the United States, first to Louisville, Kentucky. He later earned his M.A. and Ph.D. from Princeton University in 1959. Immediately afterward, he came to the University of California, Berkeley, as acting assistant professor; he became full professor in 1968. Chang-Lin was chairman of the Department of Mechanical Engineering, vice chancellor of research, and then, from 1988 to 1990, executive vice chancellor at UC Irvine. From 1990 to 1997, he was chancellor at Berkeley. He was appointed NEC Distinguished Professor in 1997, and in the same year he was appointed University Professor.

Chang-Lin Tien was a visionary who identified new, critical fields and then proceeded to carry out pioneering research in those disciplines, elucidating essential elements and phenom-

ena. He also recognized and reported on important applications of his research. One of the first investigators of heat transfer to focus on thermal radiation in gases, he provided a basis for quantifying the infrared radiation properties of gases and for generalizing these properties so that gases could be characterized in terms of fundamental variables, thus providing a foundation for current engineering approaches. Tien also made significant contributions to the understanding and determination of radiation transport in solids in the form of particulates and surfaces. He was also the first to provide a sound theoretical basis for determining dependent scattering, and his experimental results delineated the region of applicability.

In the area of thermal insulation, he studied all modes of energy transport to determine the critical and controlling phenomena governing transport in multilayer, cryogenic, and microsphere insulations. His work on porous insulation encompassed general analysis and experiments in porous media.

Tien also made pioneering contributions on microscale thermal phenomena—phonon transport in nanostructures and semiconductor superlattices, non-Fourier heat conduction in thin films, femtosecond laser interactions with thin films and micromechanical structures, heat transport in random media, picosecond optical properties of porous silicon, and microscale laser interactions with liquids. His contributions to the field, which include research, supervision of students and postdoctoral scholars, and the founding of a new journal, *Microscale Thermophysical Engineering*, changed the field and led to the new discipline of microscale heat transfer.

Chang-Lin was the recipient of numerous teaching honors. In 1962, he became the youngest professor to win Berkeley's prestigious Distinguished Teaching Award. In 1976, at the age of 41, he was elected a member of the National Academy of Engineering (NAE). He was elected a fellow of the American Academy of Arts and Sciences in 1991. In 1997, he was given the Presidential Medal by the University of California Systemwide. In 2001 he was awarded the NAE Founders Medal. He was also a member of the Academia Sinica and a foreign member of the Chinese Academy of Sciences.

In 1990, when Chang-Lin Tien was appointed chancellor at Berkeley, he was the first Asian scholar ever appointed to the top position of a major research university. His enormous energy, optimism, hard work, and excellent judgment made him an outstanding chancellor who was loved by students and respected by faculty. An excellent fund raiser during a time of severe budget restrictions, he was able to generate great support from alumni all over the world. After Proposition 209 was passed in California, he contributed significantly to affirmative action policies through a creative program called the “Berkeley Pledge.”

An avid supporter of the athletic programs at Berkeley, Chang-Lin Tien often attended the home games of the California Bears, cheering on the basketball and football teams and following the careers of Jason Kidd and other stars. Although he was only 5’7”, basketball was his passion and hobby, both as a student and later in his life.

Chang-Lin was a very disciplined individual, and he always kept a clean desk. This meant that after every trip he would come to his office, sometimes after midnight, to complete his tasks. This action typified his enthusiasm and energy. He was a warm, joyous human being who was universally admired and respected among his peers throughout the world and was recognized as a leader in higher education.

Chang-Lin published one book, edited 16 volumes, and published more than 300 research papers and monographs. His many honors and awards include 12 honorary doctoral degrees. He served on a number of boards of major universities, including his alma mater, Princeton University.

Tien’s contributions and accomplishments extend beyond science, engineering, and education. He was an ambassador to many countries, especially in Asia, in terms of public service. He was a member of the Board of Trustees of the Asian Foundation, advisor to the governor of Hong Kong, chairman of the San Francisco Bay Area Economic Forum, a member of the board of directors of Kaiser Foundation Hospitals, a Charter Member of the Council of the Oakland Museum, and a member of the Aspen Institute Domestic Strategy Group, just to name a few of his affiliations. In business, he served on the Board of Directors of

Chevron Corporation, Wells Fargo Bank, Raychem Corporation, and Air Touch Corporation.

Although he was deeply involved in many fields and activities, Chang-Lin was devoted to his family and friends. He is survived by his wife, Di Hwa, of Hillsborough, California; son Norman, and his wife, of Cleveland, Ohio; two daughters—Phyllis, of Hillsborough, California, and her husband, and Christine, of Stockton, California, and her husband. He was extremely proud of his six grandchildren. Chang-Lin's untimely death was a great loss to his family, his friends, his colleagues, and the nation.

