



Yao Jyn Li

YAO TZU LI

1914–2011

Elected in 1987

*“For contributions to innovation in instrumentation, control,
and to engineering education.”*

BY JENNIFER CHU
COURTESY OF MIT NEWS
SUBMITTED BY THE NAE HOME SECRETARY

YAO TZU LI, professor emeritus in the Department of Aeronautics and Astronautics and cofounder of the Man Vehicle Laboratory at the Massachusetts Institute of Technology, passed away on August 14, 2011, of an aortic aneurysm. He was 97.

A member of the National Academy of Engineering since 1987, YT Li (as all his friends and students knew him) and his brother Prof. SY Lee, also of MIT, were honored in China for their NAE membership with a special commemorative porcelain plate designed and presented by the Chinese space pioneer Prof. H.C. Tsien. Li’s remarkable career and life story are spelled out in his autobiography *Freedom and Enlightenment: My Life as an Educator/Inventor in China and the United States*.

YT Li was born in Peking on February 1, 1914. After earning a bachelor’s degree from Peking University and a master’s degree from Central University in China, he continued his studies in aeronautical engineering at MIT, where he received a master’s degree in 1938 and an ScD in 1939. Shortly thereafter he returned to China, where he joined the Chinese Air Force as a chief engineer. In this capacity, he oversaw the construction and operation of an underground airplane engine manufacturing plant in Guizhou Province. In 1945–1946 he worked with the Chinese government to advance aircraft technology, heading

up development of the country's first "homegrown" aircraft engine.

In 1947 he made his way back to MIT, where he became a research associate in the Department of Aeronautics and Astronautics. From 1953 to 1957, he directed the MIT Cruise Control Project in the Aerophysics Laboratory, where he worked with Charles Stark Draper to develop an automatic optimization system for the B-52 bomber.

He became a full professor at MIT in 1961, and around that time Draper paired him with a newly appointed assistant professor, Larry Young, to launch the Man Vehicle Laboratory. Together, the two investigated the effects of air and space travel on human passengers, winning a grant from NASA to study the phenomenon of space sickness—particularly for astronauts in the early Apollo program.

An energetic innovator and educator, Li encouraged students to explore their entrepreneurial spirit. In 1973, he established the MIT Innovation Center, a program designed to shepherd students through the process of innovation, from developing an idea to engineering a prototype to marketing a product. "It is a common belief that inventors and [entrepreneurs] are self-made men, born with that talent. Edison, the Wright brothers—none attended college," Li told the Associated Press in 1973, shortly after launching the program. "But with limits on natural resources, environmental concern, and the shrinking US share of the world market, we simply cannot rely upon the self-breeding process of a few innovators to keep the rest of the educated engineers employed. What we need is an organized training ground for innovators and entrepreneurs."

Young, now the Apollo Program Professor of Aeronautics and Astronautics, remembers Li as a generous mentor and friend—and a born inventor. He recalls a weekend in the 1960s when the two took a break from work to go skiing; Li had asked Young, an avid skier, for a lesson.

"We went up to Mount Sunapee...on a Friday," Young says. By Monday, "he had gotten a pair of skis and had modified them by attaching an I-bolt to the back of the ski and a little

steel cable that went from the back of the ski up to a kind of harness around his lower leg, so when he would lean forward, the ski would bend.”

The invention made turning easier: A skier would otherwise have to hop to switch directions, to prevent the back of the skis from catching in the snow. With Li’s contraption, a skier would simply have to lean into the turn.

“Only in the ’90s did the ski racers and ski manufacturers discover the ease and grace, as well as the speed, of the turn-by-leaning technique,” Young says. Li’s design “[foretold] the evolution of skis by a decade or more.”

Throughout his career, Li was a prolific inventor, with more than 60 patents to his name. In addition to aircraft optimization systems and pressure indicators for rocket engines, he patented designs for an archery bow and a tennis racket with flexibly anchored strings.

In 1972, shortly before launching the MIT Innovation Center, Li made national headlines with a particularly entrepreneurial idea: a scheme, as a Boston Globe article put it, to “tackle the tilt” of the Leaning Tower of Pisa. The idea started as a joke—Li made light of the tower’s tilt with his children, after hearing about the problem in the news. The joke turned into a project during a European tour, when Li dined with a professor then in charge of saving the tower.

Li came up with a blueprint to keep the tower from toppling, involving a ring of concrete pads surrounding the base of the tower to redistribute pressure and support the tower’s weight. The plan never gained traction, but Li, ever the entrepreneur, was unfazed. He simply moved on to his next project.

“He had an incredible way of looking at complex mechanical problems and getting to the heart of them,” Young recalls. “He was not inhibited by the conventional way of doing things.”

Li was predeceased in 2004 by his wife of 56 years, Nancy Tung Tuan Lin. He is survived by four children—Winifred and her husband William Oliver of Weston, Massachusetts; Karl and his wife Wei Xu of Millwood, New York; Kenneth and his wife Valerie Ng of Piedmont, California; and Wendy and her husband Jonathan Spector of Weston, Massachusetts—and

grandchildren Jeffries, Parker, and Alisan Oliver-Li; Lindsay, Nicholas, Jason, and Jasmine Li; and Daniel, Michael, William, and Benjamin Spector. He is also survived by his brother SY and sister-in-law Lena Lee, as well as numerous cousins, in-laws, nieces, and nephews.

His daughter Wendy wrote:

Fully committed to his work and ideas, he was also readily available to family and community. As one of nine children, YT became the oldest brother when his older brother died as a young man. He quickly assumed responsibility for helping his remaining siblings achieve their academic dreams of studying in the US. With his wife, herself from a family of eleven, the two aided siblings, cousins, nieces, and nephews with financial support, temporary lodging, and hospitality. His younger brother, SY Lee, also a member of the National Academy of Engineering, was his lifelong business partner and neighbor.

This generosity of spirit was never discussed explicitly, but his youngest daughter Wendy absorbed this lesson. "For what is the value of our work and lives if it doesn't help others, help our communities, or help the world? My father was respected for his intellect, but he was also admired for his generosity and good will."

As the grandfather of eleven and uncle to countless nieces and nephews, YT was a consistent advocate and inspiration, attending numerous athletic, musical, and theatrical performances as well as milestones such as birthdays, graduations, family reunions, and weddings.

YT was also a leader in the Chinese-American community. He was president of the National Association of Chinese-Americans in the early 1980s, and served as a behind-the-scenes diplomat in an attempt to foster relationships between Taiwan and the People's Republic of China as well as the United States and China, meeting numerous times with national leaders.

As an immigrant YT appreciated the country and culture of his childhood, but he embraced America and epitomized its pioneering, creative, and generous spirit. He loved people

and parties. He and his wife invited MIT graduate students to their house for barbecues and tennis, hosted birthday parties for friends and the weddings of relatives, and traveled extensively for business as well as for pleasure with friends and family. After his wife's death, he continued his social life as a "ROMEO"—a retired old man eating out. In his later years, he studied history, with a special interest in the Needham Puzzle, and published an autobiography. Although he was no longer able to play tennis or ski, he was an active singer, joining community choruses as a bass. He was singing when he died.