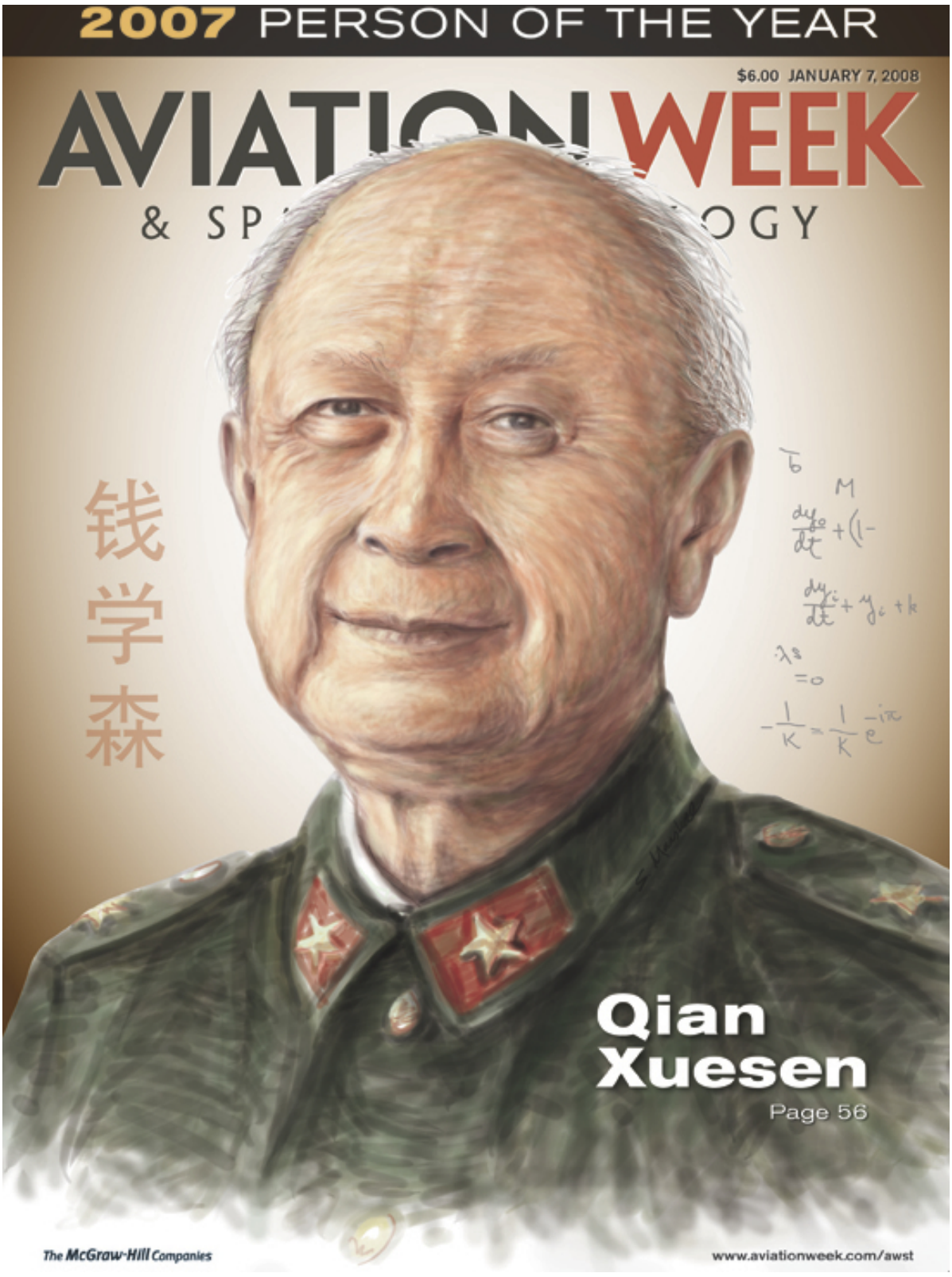


**Professor Hsue-shen Tsien (Qian Xuesen in the Chinese form) (1911 – 2009)**

**Qian Xuesen** (From Wikipedia, the free encyclopedia)
This is a Chinese name; the family name is Qian (Tsien).
Qian Xuesen (Tsien Hsue-shen)
Born December 11, 1911
Hangzhou, China
Died October 31, 2009 (aged 97)
Beijing, China
Fields Aeronautics
Institutions California Institute of Technology
Alma mater National Chiao Tung University
Massachusetts Institute of Technology
California Institute of Technology
Doctoral advisor : Theodore von Kármán
Known for: Jet Propulsion Laboratory (JPL)

Qian Xuesen was a scientist who made important contributions to the missile and space programs of both the United States and People's Republic of China. Historical documents in the U. S. commonly refer to him with the earlier family-name last spelling, Hsue-Shen Tsien or H.S. Tsien.

During the 1940s Qian was one of the founders of the Jet Propulsion Laboratory at the California Institute of Technology. During the Second Red Scare of the 1950s, the United States government accused Qian of having communist sympathies, and he was stripped of his security clearance in 1950. Qian then decided to return to China, but instead was detained at Terminal Island near Los Angeles. After spending 5 years under virtual house arrest, Qian was released in 1955 in exchange for the repatriation of American pilots captured during the Korean War. Notified by U.S. authorities that he was free to go, Qian immediately arranged his departure, leaving for China in September 1955 on the passenger liner SS President Cleveland of American President Lines, via Hong Kong. He returned to lead the Chinese rocket program and became known as the "Father of Chinese Rocketry" (or "King of Rocketry").

Asteroid 3763 Qianxuesen and the ill-fated space ship Tsien in the science fiction novel 2010: Odyssey Two are named after him.

**Early life and education**

Qian Xuesen was born in Hangzhou, the capital of Zhejiang province, 180 km southwest of Shanghai. He left Hangzhou at the age of three, when his father obtained a post in the Ministry of Education in Beijing. Qian graduated from Chiao Tung University (now spelled Jiao Tong) in Shanghai in 1934 and received a degree in mechanical engineering, with an emphasis on railroad administration; he then spent an internship at Nanchang Air Force Base. In August 1935 Qian left China on a Boxer Rebellion Indemnity Scholarship to study mechanical engineering at the Massachusetts Institute of Technology and earned a Master of Science degree from MIT a year later.

While at MIT he was influenced by the methods of American engineering education, and its focus on experimentation. Qian's experiments included the plotting of plot pressures, using mercury filled manometers.

(By contrast, most engineers in China at this time were not the "hands on" type; instead, theoretical studies were preferred.) Qian sought a school where his mathematical skills would be appreciated, and went to the California Institute of Technology to pursue his studies under Theodore von Kármán. Qian earned his doctorate from Caltech in 1939 with a thesis on slender body theory at high speeds. He would remain on the Caltech faculty until his departure for China in 1955, becoming the Robert H. Goddard Professor of Jet Propulsion in 1949, and establishing a reputation as one of the leading rocket scientists in the United States.[7]

It was shortly after arriving at Caltech in 1936 that Qian was attracted to the rocketry ideas of Frank Malina, other students of von Kármán, and their associates, including Jack Parsons. Around Caltech the dangerous and explosive nature of their work earned them the nickname "Suicide Squad."

**Career in the United States**

In 1943 Qian and two others in the Caltech rocketry group drafted the first document to use the name Jet Propulsion Laboratory; it was a proposal to the Army for developing missiles in response to Germany's V-2 rocket. This led to the Private A, which flew in 1944, and later the Corporal, the WAC Corporal, and other designs.

After World War II he served under von Kármán as a consultant to the United States Army Air Force, and commissioned with the assimilated rank of colonel. Von Kármán and Tsien both were sent by the Army to Germany to investigate the progress of wartime aerodynamics research. Qian investigated research facilities and interviewed German scientists including Wernher von Braun and Rudolph Hermann. Von Kármán wrote of Qian, "At the age of 36, he was an undisputed genius whose work was providing an enormous impetus to advances in high-speed aerodynamics and jet propulsion". The American journal Aviation Week & Space Technology would name Qian its Person of the Year in 2007, and comment on his interrogation of von Braun, "No one then knew that the father of the future U.S. space program was being quizzed by the father of the future Chinese space program."

During this time, Colonel Qian worked on designing an intercontinental space plane. His work would inspire the X-20 Dyna-Soar, which itself would later influence the development of the American Space Shuttle.

Qian Xuesen married Jiang Ying, a famed opera singer and the daughter of Jiang Baili and his wife, Japanese nurse SatÙ Yato. The elder Jiang was a military strategist and adviser to Kuomintang leader Chiang Kai-shek. The Qians were married on September 14, 1947 in Shanghai, and would have two children; their son Qian Yonggang was born in Boston on October 13, 1948 and their daughter Qian Yungjen was born in early 1950, when the family was residing in Pasadena.

Shortly after his wedding to Ying, Qian returned to America, to take up a teaching position at MIT; Ying would join him in December 1947. In 1949, upon the recommendation of von Kármán, Qian became the first director of the Daniel and Florence Guggenheim Jet Propulsion Center at Caltech.

Soon after Qian applied for U.S. citizenship in 1949, allegations were made that he was a communist, and his security clearance was revoked in June 1950. The Federal Bureau of Investigation located an American Communist Party document from 1938 with his name on it, and used it as justification for the revocation. Without clearance, Qian found himself unable to pursue his career, and within two weeks he announced plans to

return to mainland China, which had come under the government of Communist leader Mao Zedong. After Qian's plans became known, the U.S. government detained him at Terminal Island, an isolated U.S. Navy facility and federal prison near the ports of Los Angeles and Long Beach. The Undersecretary of the Navy at the time, Dan A. Kimball, tried to keep Qian in the U.S., commenting:

"It was the stupidest thing this country ever did. He was no more a Communist than I was, and we forced him to go."

Qian became the subject of five years of secret diplomacy and negotiation between the U.S. and China. During this time he lived under constant surveillance with the permission to teach without any research (classified) duties. Qian found himself in conflict with both the FBI and the U.S. Immigration and Naturalization Service, and at one point he was arrested for allegedly smuggling secret documents out of the US; these ultimately turned out to be simple logarithmic tables. During his incarceration, Qian received support from his colleagues at Caltech, including the institute's president Lee DuBridge, who flew to Washington to argue Qian's case. Caltech appointed attorney Grant Cooper to defend Qian. Later, Cooper would say, "That the government permitted this genius, this scientific genius, to be sent to Communist China to pick his brains is one of the tragedies of this century."

**Career in China**

Qian, exiled to China, has a successful career there, leading and becoming the father of the Chinese missile program with to the construction of the first long distance Chinese rocket, the Silkworm missile. A book about this scientist's life was written by Iris Chang, entitled Thread of the Silkworm.

In 1979 Qian was awarded Caltech's Distinguished Alumni Award. In the early 1990s the filing cabinets containing Qian's research work were offered to him by Caltech. Most of these works became the foundation for the Qian Library at Xi'an Jiaotong University while the rest went to the Institute of Mechanics. Qian eventually received his award from Caltech, and with the help of his friend Frank Marble brought it to his home in a widely-covered ceremony. Qian was also invited to visit the US by AIAA after the normalization of Sino-US relationship, but he refused the invitation, having wanted a formal apology for his detention. In a 2002 published reminiscence, Marble stated that he believed that Qian had "lost faith in the American government" but that he had "always had very warm feelings for the American people."

Qian retired in 1991 and maintained a low public profile in Beijing, China.

The PRC government launched its manned space program in 1992 with much help from Russia (due to their extended history in space) and used Qian's research as the basis for the Long March rocket which successfully launched the Shenzhou V mission in October 2003. The elderly Qian was able to watch China's first manned space mission on television from his hospital bed.

Science fiction author Arthur C. Clarke, in his novel 2010: Odyssey Two, named a Chinese spaceship after him.

**Later life**

In his later years, since the 1980s, Qian advocated scientific investigation of traditional Chinese medicine, Qigong and "special human body functions". Some people claim that Qian actually did not spend his effort on qigong, but that he just expressed that people should consider the widely practiced qigong in a scientific manner. He particularly encouraged scientists to accumulate observational data on qigong for the establishment of future theories.

From the early 1980s to now he studied in a number of areas, and created systematics, contributed on Marxism, science and technology system and somatic science, thinking science, natural sciences, engineering science, literature and art, military science, systems science, geography science, social science, education, etc. He was good at achievements in various fields of science-rich systems, but also concerned with the vision of science through systems established in new fields. He advanced the concepts, theory and method on systems science: open complex giant systems, from qualitative to quantitative integration of the Hall for Workshop in comprehensive and integrated systems. He opened a Chinese school of Science of Complexity. He organized scientific seminars and trained successors.

In 2008 he was named Aviation Week and Space Technology Person of the Year. This selection is given to the person judged to have the greatest impact on aviation in the past year. In 2008 China Central Television named Qian as one of the eleven most inspiring people in China. He died at the age of 97 on October 31, 2009 in Beijing. In July 2009, the Omega Alpha Association named Qian (H. S. Tsien) one of four Honorary Members in the international systems engineering honor society.

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