

and the protection of women. According to Chu's voting records as assemblywoman, she has received high ratings from liberal organizations (e.g., Planned Parenthood Affiliates of California, NARAL Pro-Choice California, and The League of Conservation Voters).

After serving two terms in the California State Assembly, Chu was elected to the California State Board of Equalization, a state agency elected by the public to be in charge of collecting various California State taxes as well providing effective and fair tax policies. She served between 2006 and 2009.

In 2009, a Congressional seat in the 32nd District opened up after Hilda Solis was appointed and assumed office as Labor Secretary in the Obama Administration. During the initial special election, Chu garnered far more votes than fellow Democrat California State Senator Gil Cedillo and was the overall front-runner. However, because of the crowded nature of the election, she could not obtain a majority win (50+1 percent of the votes) to avoid the second round runoff. On July 14, 2009, Chu went into a runoff with Republican candidate Betty Tom Chu and Libertarian candidate Christopher M. Ag. Chu won with nearly 62 percent of the votes and became the first Chinese American woman to be elected into Congress. Chu assumed office on July 16, 2009 to join ranks with few other Asian American politicians in the 111th Congress.

In the ethnically diversified San Gabriel Valley area, Chu had built political support from her Asian American base (consisting of about 13 percent of the population in the 32nd District), and expanded to include Latino voters, organized labor, and women voters. She has served the communities of western San Gabriel Valley since her early days on the school board. Chu won reelection for a full term in 2010.

*Jeanette Yih Harvie*

*See also* Political Representation

## References

- California State Assembly. 2006. Biography: Assembly Member Judy Chu. <http://web.archive.org/web/20060528234302/http://democrats.assembly.ca.gov/members/a49/biography.htm>. Accessed September 11, 2012.
- Judy Chu for Congress. 2009. About Dr. Judy Chu, PhD. <http://www.judychu.net/about.php>. Accessed September 11, 2012.
- Merl, Jean. 2009a. Judy Chu Becomes First Chinese American Woman Elected to Congress. *Los Angeles Times*, July 16, 2009. <http://articles.latimes.com/2009/jul/16/local/me-judy-chu16?pg=1>. Accessed September 11, 2012.
- Merl, Jean. 2009b. Judy Chu Defeats Gil Cedillo But Faces Runoff in 32nd Congressional District. *Los Angeles Times*, May 21, 2009. <http://articles.latimes.com/2009/may/21/local/me-local21>. Accessed September 11, 2012.
- Project Vote Smart. 2008. Representative Judy M. Chu (CA). [http://www.votesmart.org/bio.php?can\\_id=16539](http://www.votesmart.org/bio.php?can_id=16539). Accessed September 11, 2012.

## Chu, Steven (1948–)

Steven Chu, a Chinese American scientist, is a leading physicist in the world, sharing the 1997 Nobel Prize in Physics, the 12th U.S. secretary of energy, a passionate advocate for international actions to address the problem of climate change, and a leader in promoting U.S.-China scientific exchange and collaboration on this and other issues.

Steven Chu was born on February 28, 1948, in St. Louis to father Ju Chin Chu, a chemical engineering professor at Washington University, and mother Ching Chen Li, who had studied economics. As immigrants from a war-torn China with strong academic lineages, Steven's parents instilled in him and his two brothers a deep appreciation for the value of education. Growing up in Garden City, New York, where the family moved in 1950, Chu did not set, as did his older brother, the record in academic performance at their high school, but he did excel in those classes, such as geometry and physics, that interested him. Especially memorable to him was the construction of a pendulum to measure gravity.

Chu enrolled at the University of Rochester in 1966 where he was inspired by Richard Feynman's *The Feynman Lectures in Physics* and graduated four years later with a double major in mathematics and



Steven Chu, Nobel Prize winner in physics (1997) and U.S. secretary of energy (2009–2013). (Department of Energy)

physics, followed by a summer conducting research on astrophysics at the National Radio Astronomy Observatory in Virginia. In the fall of 1970 Chu, looking up to C. N. Yang and T. D. Lee, among others, as his models, went to the University of California, Berkeley, to pursue graduate studies in theoretical physics. He changed his mind after spending some time doing experimentation in the laboratory of Eugene Cummins, one of his professors. His first major experiment, conducted with Cummins and others, involved the building of laser devices to test a major theory in particle physics that was connected with Lee and Yang's Nobel Prize-winning discovery nearly two decades earlier. He received his PhD in 1976, stayed on as a postdoc for another two years, was offered an assistant professorship in physics at Berkeley but was allowed to take a leave of absence to become a visiting researcher at the famed Bell Labs at Murray Hill, New Jersey in the fall of 1978.

The excitement of doing cutting edge research within the stimulating and supportive environment at

Bell Labs proved irresistible and Chu never returned to his Berkeley post. At Bell, Chu conducted a difficult experiment with colleague Allen Mills to produce and measure, using laser beams, the energy levels of positronium, which is the most basic atom and that consists of only an electron and a positron (anti-electron). In 1983, Chu became head of the Quantum Electronics Research Department at the Bell Labs' branch at Holmdel, NJ, and soon began to work on trapping atoms with lasers with collaborators after learning of its possibility from a colleague.

Atom trapping was a field fraught with both experimental and theoretical obstacles, but Chu and his group introduced innovations, such as counterpropagating beams of laser light, "optical molasses," and magneto-optic trapping, that eventually enabled them to be among the first in the world to successfully cool sodium atoms to barely above absolute zero degree and then trap them with lasers and magnetic fields in the mid-1980s. This achievement made Chu a winner of the 1997 Nobel Prize in Physics, which he shared with Claude Cohen-Tannoudji and William D. Phillips "for the development of methods to cool and trap atoms with laser light." The development opened vast new areas of scientific research and technological applications, including the construction of atomic clocks much more accurate than existing ones.

Indeed, the atomic clock was what Chu worked on when he moved from Bell Labs to Stanford in 1987, when he felt "the urge to spawn scientific progeny." At Stanford he also worked with his graduate students and postdocs to improve laser cooling and trapping and to use the technique to solve problems in biology and polymer science. For example, he and collaborator Steve Kron developed a method (a kind of "optical tweezers") to hold and observe a single molecule of DNA. He soon became a well-known advocate for "Bio-X," interdisciplinary biomedical research drawing ideas and methods from a variety of fields such as physics, chemistry, and engineering. He also served as chair of Stanford's Physics Department from 1990 to 1993 and again from 1999 to 2001.

In 2004, Chu moved back to UC Berkeley to become a professor of physics and cellular and molecular biology as well as director of the Lawrence Berkeley National Laboratory that the university runs

for the U.S. Department of Energy. His most notable achievement at the Berkeley Lab was to reorient its considerable interdisciplinary resources toward finding solutions to two of the most critical problems facing the world today: global warming and renewable energy. He was instrumental in the establishment of two new institutions in these fields in the San Francisco Bay Area: the Joint BioEnergy Institute (JBEI), with \$135 million in funding from the U.S. Department of Energy, and the Energy Biosciences Institute (EBI), funded by a \$500 million grant from British Petroleum. Chu's concerns over climate and energy also led him to speak out internationally, including in China, for taking actions to address these problems.

Because of both his scientific stature and his advocacy on global warming and renewable energy, Steven Chu was nominated by Barack Obama as his secretary of energy in late 2008. The appointment, which was confirmed by the U.S. Senate in early 2009, was met with widespread approval from the American scientific community. In announcing Chu's appointment, Obama called it a sign that the new administration would respect science and take seriously the threat of global climate change. In his new position he has worked to implement Obama's ambitious plans to invest in alternative and renewable energy, to create millions of new, clean-energy jobs, and to curb global warming. He has also traveled to China to encourage the Chinese government and the Chinese scientific community to work with the United States to find solutions to the problem of global climate change. In this regard, his identity as a Chinese American scientist and his long-standing collaboration with Chinese scientists—he was elected both a member of the Academia Sinica in Taiwan and a foreign member of the Chinese Academy of Sciences in Beijing—have proved to be an asset.

Chu resigned as secretary of energy in 2013 and returned to Stanford University.

*Zuoyue Wang*

## References

- Chu, Steven. 1997. "Biography." [http://www.nobelprize.org/nobel\\_prizes/physics/laureates/1997/chu-bio.htm](http://www.nobelprize.org/nobel_prizes/physics/laureates/1997/chu-bio.htm). Accessed September 11, 2012.
- Chu, Steven. 2009. "Nobel Lecture." [http://www.nobelprize.org/nobel\\_prizes/physics/laureates/1997/chu-bio.htm](http://www.nobelprize.org/nobel_prizes/physics/laureates/1997/chu-bio.htm). Accessed September 11, 2012.
- Eljera, Bert. 1997. "The Ultimate Physics Club: Stanford Professor Steven Chu Graduates to the Rank of Nobel Laureate." *AsianWeek*, October 23–29. [http://asianweek.com/102397/cover\\_story.html](http://asianweek.com/102397/cover_story.html) in October 2009. Accessed September 11, 2012.
- "Steven Chu, Secretary of Energy." 2009. [http://www.energy.gov/organization/dr\\_steven\\_chu.htm](http://www.energy.gov/organization/dr_steven_chu.htm). Accessed September 11, 2012.

## Chung, Connie (1946–)

Connie Chung is a Chinese American journalist and news anchor. She became the first Asian and the second woman to anchor a major American network news show. Over her career, Chung took positions at CBS, ABC, CNN, and NBC, and conducted numerous exclusive interviews. She has won several awards, including a Peabody and three Emmys.

Chung was born in Washington, D.C., on August 20, 1946, with the given name Constance Yu Hwa Chung. Her father, William Ling Chung, was a prominent diplomat in the Nationalist government in China. Because of the Japanese invasion, the Chung family had fled to Washington D.C. in 1944. Five of the family's eventual ten children died in China. Chung was the only one born in the United States.

Chung's initial career dreams were far from journalism. Growing up in a Maryland suburb, she fantasized of being a ballerina. As a college student at the University of Maryland, her major through her junior year was biology. However, a junior summer internship with a congressman changed everything. Chung was able to see reporters in action for the first time, and became interested in writing. She returned to college and changed her major to journalism. She was subsequently hired by WTTG-TV in Washington. Reflecting on her career choice in a 2011 interview, Chung said, "For a small, diminutive-sized Chinese person who grew up in a very loud family and never spoke up in my life, it was very dramatic."

At WTTG, she was promoted from copy editor to news writer, assignment editor, and then finally reporter.