



IN MEMORIAM

George Lewis Turin
Professor of Electrical Engineering and Computer Sciences, Emeritus
UC Berkeley
1930-2014

George Lewis Turin was born in New York City on January 27, 1930. He was raised by his mother, Lillian Turin, who, in the midst of the Great Depression, found a job working to support herself and her two children, George and Connie. His wasn't your average Upper West Side existence; George's grandfather, a Lithuanian immigrant, was co-proprietor of the legendary Luxor Baths, where politicians and gangsters were said to convene. Lillian later became the manager of the baths.

A "radio shack kid," Turin was an early hacker who spent many hours building ham radios and communicating in Morse code with other operators around the world - an experience that inspired his early academic work in radar distortion and his contributions to cellular communications theory. After graduating from the Bronx High School of Science in 1947, Turin enrolled at MIT. He called those years the "golden age of communications theory," a time when current events raised important academic research problems. Building alliances between business and academia would become an underlying theme in Turin's work. He received the S.B. (1951), S.M. (1952) and Sc.D. (1956) degrees from MIT.

From 1952 to 1956, Turin worked at MIT's Lincoln Laboratory in Lexington, MA, while getting his Sc.D. From 1956 to 1960 he was a staff member of the Hughes Research Laboratories, Culver City and Malibu, CA. He joined the Berkeley Department of Electrical Engineering and Computer Science (EECS) in 1960. During his UCB career, he chaired EECS (1980-1983). He left Berkeley to become the Dean of Engineering and Applied Sciences at UCLA (1983-1986). He returned to Berkeley as a regular faculty member in 1986, retiring in 1988. He then spent seven years full time at Teknekron, a consulting and business development firm.

At MIT, he was part of a legendary group of graduate students who pioneered the use of statistical techniques in processing signals corrupted by random disturbances. Others in the group include such illustrious names as Amar Bose, Irwin Jacobs, Tom Kailath, Andy Viterbi, and Jack Wozencraft. Turin's specialty was to deal with radio and radar signals that had been corrupted, not only by noise, but also by passage through multiple and random pathways. His interest in this topic persisted throughout his career. In the 1970s and 80s, he adapted his earlier work to radio communications for vehicles in urban settings, where the scattering of radio waves was similar to his multipath work on radar. In many ways this work anticipated the technologies of cell phones that are in use today.

Turin played a major role in the teaching of communications technology at Berkeley. He developed an instructional laboratory in digital communications that involved a highly innovative blend of experimental and computer simulation techniques. Several generations of students benefitted from working in this laboratory. He supervised 29 Ph.D. students.

As EECS chair, Turin was an energetic leader with interesting and entrepreneurial ideas, such as funding a new Computer Science building that also contained industrial laboratories, to be paid for by the companies involved. (The campus administration was not receptive to that idea.)

Turin took some worthwhile and fruitful sabbaticals. A Guggenheim Fellowship enabled his first, in 1966-67. He was associated with the Faculte' des Sciences at the University of Paris, where he began work on his book on the mathematical theory of communication. ("Notes on Digital Communication." 1969). In 1974, he spent a one- semester sabbatical in Hawaii, where he went to immerse himself in the theory and protocols of the ALOHAnet digital- data radio network, at the time being implemented within and among the Islands with the help of the Electrical Engineering Department at the University of Hawaii. Its groundbreaking technology inspired the now- dominant Ethernet, which was invented a bit later. His final sabbatical was in London in 1983 at the Imperial College of the University of London, working to apply his recent theoretical research to the emerging cellphone technology.

Turin served as Vice President, Technology, of Teknekron Corporation, a Bay Area firm he helped found in 1968. Teknekron specialized in starting high- technology firms with close links to researchers in universities and other research institutions. From 1968-88, Turin consulted with Teknekron; after his retirement, he worked there full time until 1995. Teknekron became a unique platform for entrepreneurship. Most would- be entrepreneurs would look for capital to design, build and sell a product they envisioned. Teknekron instead worked with these entrepreneurs to first find a market, and then to develop a product for which a market had been shown to exist; this was called "sell, design, build."

Turin's first project had to do with radio multilateration, i.e., measuring location by comparing the times of arrival at dispersed listening posts of a radio signal from the vehicle. He spent the 1969-70 academic year on industrial leave, at Teknekron, working on this project, and created a very good system for radio location.

As Turin noted in his blog, "The project went under a rubric that encapsulated its purpose, "Public Urban Locator Service" or PULSE, which was emblazoned on the side of a truck. In the Berkeley of the late 1960s, we should have known better. The constant appearance in the streets of a truck so- labeled, bristling with antennas, stoked an inevitable Berkeley paranoia: were we part of some nefarious project that was tracking innocent people? We attracted much attention and some protest." Turin returned to Berkeley with ~100,000 punch cards of data, which led to several PhD theses and a further- enhanced model of the urban radio medium. That model was used in the design of the GSM cellular telephone system, now a worldwide standard.

Turin was committed to and supportive of high- school minority- outreach programs.

He founded the Helen Green Turin Memorial Fund at the College Preparatory School, in Oakland, which funds a new student every four years. He also supported students at the Eastside College Preparatory School in East Palo Alto, where a fund has been established in his honor. At Berkeley, he became director of Berkeley's MESA (Mathematics, Engineering, Science Achievement) program for minority students.

In the early 1980s, Turin served as the first chairman of Gov. Jerry Brown's MICRO (Microelectronics Innovation and Computer Research Opportunities) program, which matched industrial contributions with state funds to support faculty research. He was also an art collector, and supported promising young artists. He was a founding member of the Cory Hall Statistical Seminar (a poker game), which began in 1964 and is still in existence today.

Turin was a Fellow of the Institute of Electrical and Electronics Engineers, a Guggenheim Fellow, a Fellow of the British Science and Engineering Research Council, and was a member of the National Academy of Engineering. He was a trustee of the College Preparatory School of Oakland, CA, and on the Board of Tenera Corporation.

At a dinner party in 1963, he met Helen Elizabeth Green, the fun- loving daughter of a Utah cattleman. They married on September 11, 1964; she died on July 28, 1998. He is survived by his two children, David and Abigail, and grandchildren Grace and Helena.

Alan Jay Smith
Steven Schwarz
Abby Turin
David Turin