



To the Moon and Back
Dr. Allen Katz
K2UYH SK
1942 - 2024

Retrospective by Rebecca Mercuri, Ph.D., IEEE Senior Member and Distinguished Contributor

In the early morning of June 20th, at the setting of the full moon on Summer Solstice day, the IEEE and PCJS communities lost our treasured Life Fellow, Allen Katz, to metastatic cancer. Dr. Katz held three degrees in Electrical Engineering -- B.S.E.E. and D.Sci. from the New Jersey Institute of Technology, and an M.S.E.E. from Rutgers University. At the time of his passing, he was a full-time Distinguished Professor of Electrical and Computer Engineering at The College of New Jersey (TCNJ), and also the school's longest-serving faculty member, having taught and mentored some 2,000 students over the course of 50+ years. As a master of multi-tasking, Al was also concurrently a Distinguished Technical Fellow at MACOM, the successor company to Linearizer Technology, which he had founded and served as Board President from 1991 to 2023. His technical work spanned the frequency range from UHF through Ka-band, E-band, Q-band, and the EHF V and W bands, and involved both hybrid, MMIC, and photonic circuits, including the design of the first practical MMIC linearizer. He was the current and long-time chair of the Antennas and Propagation Society / Electron Devices Society / Microwave Theory and Technology Society (AP/ED/MTT) joint chapters in IEEE PCJS.

Dr. Katz was also a co-founder, with Sol Libes, of the Trenton Computer Festival (TCF) <tcf-nj.org>, which is noted as the oldest personal computer show world-wide. At its peak, in 1988, TCF filled a convention center with approximately 30,000 attendees. Keynote speakers each year were a veritable Who's Who of Computing, including: John and Kay Mauchly, David Ahl, Adam Osborne, Gary Kildall, Bill Gates, Phil Zimmerman, Emmanuel Goldstein, and Richard Stallman, to name but a few. The recent TCF2024 (co-sponsored by PCJS's ACM/IEEE Computer Society) had the theme of Generative AI, and featured 50 speakers with 10 tracks of lectures on a wide range of topics, a Ham Cram & Exam, banquet, and a battlebot competition. The abstract for Al's talk, Computer Generated Lifeforms, in the Tutorial and Tech Track, stated: "Many people are not aware that my doctorate involved artificial neural networks at a time before this topic was not yet popular. Although not deeply involved with computers, I taught microcomputers for several years because there was no one else around to teach these courses. As a result, I started thinking about: *Could computers think in a way like humans? Is an electronic (computer) life form possible? Would such life forms want to communicate with us because of the huge difference in the speed of the processing elements that make up these systems?*"

As a personal aside, Al later enlisted me to teach that same microcomputers course at TCNJ, so he was actually "my boss" for a while, in his role as E.C.E. Department Chair. It was typical for him to identify talented people and engage them in various creative ways. He hired numerous of his TCNJ students to work at Linearizer, and involved them at IEEE, through the Student Chapter and also (following graduation) in leadership roles with the Princeton / Central Jersey Section. His enthusiasm for the accomplishments of others was as great, if not even greater than his own! In November of 2023, when I was (unexpectedly) presented with a Region 1 award "for training women and youth in engineering concepts involving amateur radio" Al stood proudly beside me at the ceremony, with a beaming smile. He was always available to answer questions, and if there was a disagreement, it would eventually blow over and there were no hard feelings attached. His countless impromptu or scheduled meetups at the

Uno's restaurant in Hamilton were legendary. For myself, often after what I had thought was just a social hang, I left with some challenging ideas, and it would take me a while to realize that Al had planted them. His beloved wife, Sally, accompanied him to conferences world-wide, and many IEEE folks also got to know her through attendance at our annual banquets and awards ceremonies. Also cherished in Al's life have been his two daughters Alisha and Tova, and their husbands and children.

The breadth of Dr. Katz's knowledge and expertise is noted by the courses he taught at TCNJ, including: Circuit Analysis, Communications Systems, Electronics Laboratory, Engineering Electromagnetics, RF/Microwave Engineering, and Wireless Communications. He was also a popular Senior Project Advisor, encouraging students to incorporate radio into their research, and promoting their accomplishments. See: <www.youtube.com/@TrentonComputerFestivalTCF/videos>.

In 2000, Dr. Katz was elevated to IEEE Fellow, and was also elected as a Distinguished Microwave Lecturer with the IEEE MTT Society. He received the William Randolph Lovelace II Award from the American Astronautical Society in 2002 for "technical leadership and contribution to significantly increase satellite communications payload performance through the development of microwave linearizer technology." Other recognitions included: the ARRL Technical Merit Award in 1976, the John Chambers Award in 1983, the IEEE Centennial Medal in 1984, the GE ASD Technical Excellence Award in 1990, the IEEE Region I Achievement Award in 1992, the Martin Marietta Astro Inventor of the Year award in 1993, and the IEEE Region 1 Technology Innovation Award in 2007.

Al presented and published over 50 papers (often with other authors), including many for IEEE Conferences and Journals, such as: IEEE Microwave Magazine, IEEE Transactions on Electron Devices, IEEE Radio and Wireless Symposium, IEEE International Vacuum Electronics Conference, IEEE Conference on Power Amplifiers for Wireless and Radio Applications, IEEE/MTT-S International Microwave Symposium, IEEE Benjamin Franklin Symposium, and the IEEE Military Communications Conference. Professional affiliations in addition to IEEE include the American Institute of Aeronautics and Astronautics, and the American Society of Engineering Education. Also was a long-time member of the Delaware Valley Radio Association. Dr. Katz is a listed inventor or co-inventor of 21 patents, for Lockheed Martin, Martin Marietta, GE, and RCA. Some of his linearizers are on Telstar 1 and 2.

Radio technology was always a constant thread in Al's life. His younger sister, Joan, recalled that when her brother was 13, she would hear him calling on voice or tapping out Morse Code for CQ CQ CQ KN2UYH (his original callsign) well into the night, to make radio contacts. In 1958 he upgraded to General, as K2UYH. FCC records show that Al took advantage of the 1999 rule change to upgrade from Advanced to the highest license level, Amateur Extra, on June 10, 2000. As a Charter Member of the SETI League <www.setileague.org>, an "international grass-roots organization dedicated to privatizing the electromagnetic Search for Extra-Terrestrial Intelligence," Al also served as their long-time EME (Earth-Moon-Earth) Committee Chair, where he helped their "members use signals reflected off the lunar surface to validate and calibrate their SETI receiving systems." Al's fascination with EME led to him installing a 28-foot dish antenna (obtained at a surplus sale) in the back yard of the family home. His achievement of the first-ever Worked All Continents with Moonbounce on 432 MHz credential on July 29, 1976, after week-long operations, was featured as the September 1976 cover story of QST magazine <www.ok2kkw.com/next/eme1976wac.htm>. Allen's 2019 tutorial "Getting Started on EME using Digital Techniques" is at <www.youtube.com/watch?v=hRwDWHNjPL4>. As Al was preparing to host the 20th EME Conference <eme2024trenton.org> at TCNJ, life took a final turn. The EME organizers and IEEE PCJS ensured that the event would be held in his memory.

Thank you, Dr. Allen Katz, for sharing your knowledge and giving us the Moon to remember you by.