

Carter M. Armstrong

Carter Armstrong retired as the director of advanced development at L3 Harris Electron Devices in Torrance, CA, at the end of 2020, bookending a 40-plus year career in nonneutral plasma physics/electron beams and RF vacuum electronics. Over that period, he worked in academia (North Carolina State University, Physics Department), government research (Naval Research Laboratory) and industry (Northrop Grumman, Litton Electron Devices, and L3 Communications/L3 Harris Technologies). During this journey Armstrong worked on or led the development of gyro-amplifiers/oscillators, ubitrons, helix and folded waveguide TWTs, and microwave and millimeter wave power modules. A development scientist at heart, he worked on and supervised exploratory research & development on novel device concepts including cold cathode TWTs and emission-controlled devices, to name a few. In his role as the vice president of engineering at L3 Electron Devices, San Carlos, CA, he instituted a highly successful engineering intern program, bringing many talented young engineers into the field of vacuum and power electronics.

Known for speaking his mind (hopefully rationally), Armstrong authored the feature article *The Truth about Terahertz* in the September 2012 issue of IEEE Spectrum. Carter subsequently published two additional articles in Spectrum: *The Quest for the Ultimate Vacuum Tube aka cold cathode TWT* (Dec. 2015) and *The 11 Greatest Vacuum Tubes You've Never Heard Of* (Nov. 2020).

Armstrong received his AB, Physics, from Rutgers University and his Ph.D. in nonneutral plasma physics from the University of Maryland. He is an IEEE Fellow and the 2013 recipient of the J.R. Pierce Award for Excellence in Vacuum Electronics. He has been an adjunct professor in the Electrical and Computer Engineering Department at the University of Wisconsin since 1996.

Since retiring, Carter has done some consulting and advising, all while stubbornly trying to complete analysis relating to research performed at NC State in the late '70s/early '80s. Persistence is a virtue is what he tells his wife when she asks incredulously, "Just what are you doing?"