Bio Robert Anholt


My 1970 award from the Portland section of the American Chemical Society was one of the things that allowed me to graduate from Reed College in 1971 and earn a Ph.D. from University of California in 1976 with no debt. My Ph.D. and subsequent work as a Research Associate at Stanford until 1989 studied high energy ion-atom collisions in which the inner shell electrons, being much faster than the movements of the fly-by projectiles, have time to briefly form diatomic molecules. When the projectile carries say 1s vacancies into the collision, one can get a continuous spectrum of x rays from the separate target and projectile K x rays to the united atom x rays. Although relativistic quantum mechanics breaks down for atoms with atomic number greater than 137 (when the 1s electron velocities approach the speed of light), we have studied uranium-uranium collisions that briefly form Z=184 in which the K shell can decay by creating electron-positron pairs. In addition to this quasi-molecular x-ray production I studied how molecular formation affects the yield of target and projectiles x rays. At Berkeley's Bevalac accelerator I also studied x-ray production by heavy ion-atom collisions where the projectile moves at nearly the speed of light; no molecular effects at those speeds but interesting relativistic effects come into play.

During my last year at Stanford I switched to process and device modeling of gallium arsenide (GaAs) semiconductors. My initial interest was faster computers because electrons move faster in GaAs, but it turned out that a much more important fact was that native, undoped GaAs is a better insulator than silicon so one can lay microwave transmission lines on the substrate. I developed the first process and device modeling program for GaAs field effect transistors at Stanford then for my wife's academic career, moved to Minnesota where I formed a one-person company to market this computer program to companies. In 1990 DARPA started a large research and development program for microwave integrated circuits made of GaAs and related materials where I was the smallest contractor. While DARPA's and the military's interest was in things like phased array radars in fighter aircraft, the greatest benefit is the microwave chips in cell phones, in cell phone towers and (at last, in my new Toyota) car radar.

Along the way I published a couple of hundred articles in peer-reviewed journals and one book on GaAs devices. I am now retired and pursue ballroom dance as a hobby doing the kind of thing one sees in TV's dancing with the stars.