

## George Gamota's Biographical Sketch

I went on to the University of Minnesota to pursue electrical engineering. However, soon after I started taking second year honor classes in physics and math, I changed my major to physics because I was inspired by the developments in solid state physics and its potential impact on the future of electronics – vacuum tubes were out and transistors were in. EE was still all about vacuum tubes and no one was teaching solid state. Sputnik and the race for the moon added to the technology euphoria, of the time. I had to choose between solid state physics (semiconductors) and space physics – it was not easy. In the end I chose solid state physics, in part because I found a professor whom I liked and who offered me a part-time job in his laboratory. His name was Michael Sanders. He became my mentor and a life long friend. I also was inspired by Ed Nye. He was a bit crazy but his teaching was excellent and I remember once when returned from Africa observing the total solar eclipse he had many fascinating stories that he shared with us.

I started working in a physics lab rather early and by my senior year I was working on a project that eventually led to my Masters thesis. I received my Bachelor's degree in 1961,

1961 was a big year for me in my love life. I married my Latin sweetheart – Christina. Christina (Dawydowycz) arrived from Argentina in 1959, and after a year of engagement we were married in August 1961. Christina was also born in Ukraine so we had many things in common.



Being poor and students, our honeymoon started off with us driving to the Black Hills, South Dakota. Despite it being summer and our best laid plans, we found it to be cold, rainy and rather miserable, so we decided to drive further west, and west we continued until we reached the West Coast. On the left is our wedding picture.

Our first apartment was in Minneapolis, close to the university. In addition to taking a full load of courses, I also worked in the physics lab helping Dick Pontinen, who was one of Mike Sanders' PhD. students. I am not sure how much help I was to Dick but I learned much about Si and semiconductors. Christina took a job to help pay our bills as an associate at Dayton's art department, and thus started us to a life long appreciation and collection of art.

My MS thesis was to design

and build a  $\text{He}^3$  cryostat to be able to study the behavior of materials at very low temperatures. The cryostat was built to potentially use it to study nuclear materials that might become useful for targets. I did the work together with Chester Hwang who was a post doc in the nuclear group but worked with Mike to learn low temperature techniques. Besides Dick, other students at Mike's lab were Arnie Dahm, Jim Levine and Jan Northby joined us later.

While in graduate school, I met new friends a number of whom later on had an impact my career. One was Marty Fricke and another Carlos Avery. My two years at Minnesota went fast and in 1963 after I received my MS. I was ready for the next set of challenges and changes in life. The most important challenge ahead was our imminent parenthood. Christina was expecting and was to give birth to our oldest son sometime in spring of 1964.



The second change in our life was to move to Ann Arbor Michigan, We were leaving Minnesota-our family, friends, and our home for Ann Arbor and the University of Michigan. We were part of a caravan leaving Minnesota since Mike Sanders accepted a position at the University of Michigan. Jan Northby came as well although he continued to be officially a student at the University of Minnesota. Jim Levine graduated as well as Dick Pontinen. Arnie was too far in his research and decided to stay although Mike still helped supervise his research. It was the first of many moves in our life (We might still be moving were it not for Christina to have said enough is enough and in 1986 we settled for good in Lexington Massachusetts). On the photo to the right, Christina and I are moving to Ann Arbor. The trailer was full of our goods as well as some equipment that Mike took with him.

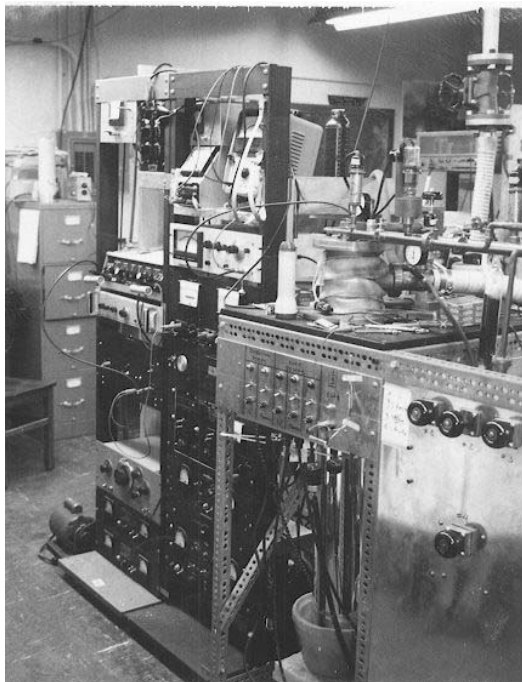
Ann Arbor was a great college town that was, at that time, dominated by the university, especially on football Saturdays in the fall. On October 1965, our second son was born and in 1966, I finished my thesis, completed my written and oral exams and received my PhD. For her support and patience, Christina received an honorary degree: PhT (pushing hubby through). My thesis studied the movement of newly discovered microscopic charged vortices (analogous to smoke rings in air) in superfluid helium. I continued another year at the University of Michigan as a post doc, teaching and working with new graduate students, getting ready for the arrival of our third son, and looking for a job. My first student that I supervised, Burt Brody, turned out to be a real friend not only to me but also to my family as we struggled with health issues. Even today he is like an uncle to our boys, and now to the grandchildren.

Jobs for recently minted PhD's in physics were not plentiful at this time, but I was fortunate to have had several options. We considered the University of Illinois, Urbana, staying at the University of Michigan, etc. However, when I was offered a position at Bell Laboratories at



Murray Hill, NJ, it was an easy decision. During the summer of 1967 we moved to Summit NJ to start a new life on the East Coast with Bell Labs. Our third son was born in Summit in October 1967.

Our life in Summit had a challenging beginning. Our oldest son, George Jr. was seriously ill and almost immediately needed surgery to save his life. His kidney illness in Ann Arbor had been misdiagnosed and by the time we arrived in Summit, his kidneys were failing. He had to have major surgery to repair his urinary track valves. Fortunately, with God's help the operation was a success but the damage to the kidneys left a long term effect on his health, one that is still with us – he has a kidney transplant in October 2007.



Working at Bell Labs during the late 60's and early 70's was very exciting to me as a young scientist. Not only was I mingling with the pioneers in solid state physics but also Nobel laureates from all over the world. Many of my colleagues later received Nobel Laureates in their own right. Others became presidents, chancellors or deans of major universities: University of California, Berkeley, Harvard, and Hong Kong University of Technology. Bell Labs was probably the most exciting scientific environment that existed in the 20<sup>th</sup> century. Unfortunately for us as a nation, this cradle of scientific greatness started to crumble in late 70's and was destroyed in 1984 by a federal judge who broke up the Bell System. Lacking the resources provided by AT&T, Bell Labs continued to retract with

the last insult being that its bones were sold to a French company, Alcatel, a year or so ago.



My research at Bell Labs eventually expanded to include superconductivity. About that time, I also became interested in science policy and science in politics. After a short term assignment at the state level of New Jersey, I took a two year sabbatical from Bell Labs to go to Washington, DC. It was 1974, President Nixon just resigned, President Ford took office and the after effects of the Viet Nam war were all still evident in the science community, especially affected were those who were supported by the Department of Defense. Once considered as heroes for helping win World

Wars II, many of these same scientists were now blacklisted on campuses. Contributing to this was the congressionally passed Mansfield Amendment which required that all research supported by the DoD be related to weapons development. After much soul searching and with help and support of the Vice President for Research at Bell Labs, William O. Baker who was then the unofficial President's Science Advisor, I took a job at the Pentagon to try to remedy the problem.

The experience of moving from a mostly academic environment at Bell Labs to the Pentagon was quite a jolt. First of all, was the realization that everybody working there held the rank of colonel or higher. In fact colonels were a dime a dozen and most acted in secretarial positions. Being a civilian, I was given an equivalent 2 ½ star General's rank. At 38 it felt good to think that I could tell a one or two star general what to do. My first experience at the Pentagon on the second day was to be told to attend a meeting on lasers. I followed instructions and showed up to a very crowded room. As I came in, people who were seated stood up, and I soon realized that I was to lead the discussion, and a seat was reserved for me at the head of the table. This turned out to be a typical experience while at the Pentagon. I got called many times to sit in or lead a discussion on topics I had little time to prepare. I also quickly understood that most activities were tied to a cyclical pattern – fiscal budget, and you either testified on ongoing programs, programs that you want funded, and plans for the future. Finally I found out that if you wanted to change something, you had to work very hard, and do it on your time since 8-5 most days was taken with attending meetings, conferences, and appointments.



After two years, I was ready to go back to Bell Labs. President Ford lost the election, my mentor Bill Baker was no longer the presidents Science Advisor, and I had a political job (political positions get changed with changes in Administrations, especially if parties change. In addition,

I was discouraged since I really could not get the necessary attention at the highest levels to help change the policy to support basic research. Our then Secretary of Defense, Donald Rumsfeld did not care about research, and his deputy was similarly disinterested. I literally could not write “basic” in front of research without it being crossed out by someone above me.

In spite of my prediction, the 1976 Presidential election impacted me rather differently than I thought possible. Harold Brown was chosen by President Carter as Secretary of Defense and Frank Press



was named Science Advisor to President Carter. During my two prior years at the Pentagon, I befriended both of these gentlemen in my quest to defang the Mansfield Amendment, and they both urged me to stay on, promising to help promote research and create an Office of Research in the Pentagon. With the writing on the wall on the fate of Bell Labs, and being offered such an opportunity, I stayed on. Little did I know the difficulty in changing the culture at the Pentagon even if the top people were supportive of change. It took me nearly four years to achieve my goals: the Mansfield Amendment was defanged, and an Office of

research was created in the Office of the Secretary of Defense. That office still exists today.

Family life was a bit of a struggle during this period. We lived in Reston, Virginia, which was on good traffic days, an hour away from the Pentagon. I often left at 6 and came home after 7pm. My boys started out in public schools but had to switch to a private school for grades 7 and 8. My youngest son stayed in the public system because he qualified for a special gifted program. To help send the boys to schools, Christina started volunteering at the private school where they attended, and subsequently received a job offer to teach kindergarten, something she always wanted to do. Life in Washington was very exciting, especially for the boys. We all celebrated the bicentennial sitting on the Mall across from the Lincoln Memorial. We often went to Washington on weekends, visiting museums and the beautiful parks.

In 1980, with a new election cycle, change in party of power, and pressing need to worry about paying for college for my three sons after a few months with the Reagan administration, I decided to go back to Ann Arbor. I accepted the position of Director of an interdisciplinary institute, and a full professor of physics. Life in Ann Arbor had a difficult start. Our middle son Daniel, then 16 suffered a massive stroke. Suddenly a healthy teen was paralyzed and blind. Only through the grace of God and many prayers, he slowly recovered, and within several months was able to go back to school. To this day we thank all those who prayed for him during this very difficult time. He is doing well now, he finished his school, and went on to earn a PhD in materials science and engineering. He is married, a father of two boys, and a manager at Motorola doing what his father did – research.

Unfortunately, academia proved to not be as fast paced or exciting as Washington. Having been there it was harder to leave mentally, if not physically. Fortunately, I ran into many old buddies from graduate school, both from Minnesota and Michigan. The most important connection was with Marty Fricke, who was a VP at Science Applications. He hired me as a consultant, as we both won a major contract to start what eventually became a major US Government in benchmarking foreign science & technology. I also ran into another one of my graduate student buddies from Minnesota, Carlos Avery. Main countries to benchmark at that time were the Soviet Union, and then later Japan as it challenged the US in technology. Those programs expanded greatly over the years, and although I am no longer involved, many are still operating. One additional perk that came along with the consulting, Marty’s office was in La Jolla California, and conveniently

he invited me to “consult” for longer periods of time during the winter months. I remember how happy the whole family was to pack and leave in December the gray cold skies in Michigan to come to sunny California and the La Jolla beaches.

After working at Bell Labs, and then Washington, Ann Arbor was not as stimulating as I had hoped, even with consulting in Washington. Academia was, shockingly, even more bureaucratic than the Pentagon. To get things done required endless hours of negotiations, and patience. The ongoing battles between the various schools were notorious and as a director of a self standing, self supported interdisciplinary institute, I was an easy target. The extreme liberal community held it against me (and the Institute) that I had previously worked in the Pentagon. Also, I had to deal with various threats and negative stories that ran in the local newspaper. Some were quite inflammatory. I also had to deal with various threats and negative stories that ran in the local newspaper. The most outrageous act that I was accused of was for setting a fire in the economics building. I was accused of starting it so that a weapons related institute could be built in its place in the center of the university. My family was affected as well. My youngest son, Alex, who was still in high



school heard a teacher in class call me by name as someone who was bringing blood money to Ann Arbor. In 1986, when my last son graduated from college, Christina and I left for the East Coast again. I was offered a position as president of Thermo Electron Technologies Corporation in Waltham, Massachusetts, and took it without much hesitation. We packed up and moved to Lexington where we still live today.

Lexington is a great little town. Its fame is forever integrated with the beginning of American independence and history, and both Christina and I are fervent volunteers and long term members of the Lexington Historical Society. Every April 18<sup>th</sup>, we get

up at 4am to watch the British Army march into Lexington as a small band of Minutemen try to hold them off. Yes American history began right here, and I urge all to visit Lexington at least once.

Another surprise in Lexington was that a brother of a very good friend of ours turned out to Rick Bernel who was a good friend from Minnesota. He was a grad student there during my time.

I left my industrial post in 1996, and started full time consulting, using my small high tech firm (Science & Technology Management Associates) as a base. When the Soviet Union fell apart in 2001, and Ukraine became independent, I offered my services to help the scientists in Ukraine. I led a delegation of physicists as part of the American Physical Society’s emergency program, and provided them books, computers, and most importantly small grants to the young scientists to help them bridge the abrupt change in their surrounding.

Also, as part of a US delegation under the auspices of the Academy of Sciences, I helped convince the Ukrainian government to give up its nuclear weapons, and as a benefit helped set up the Science & Technology Center in Kyiv (correct spelling of the capital of Ukraine formerly



known by its Russian name as Kiev). Over the next 6 years I visited Ukraine many times, spending weeks at a time there in a rented apartment. One year, I remember we had Thanksgiving in Kyiv, including all the trimmings and even Maple leaves from Lexington that Christina brought with her.

My work in science evolved from building bridges between Ukrainian and American scientists at first, to later helping them start up small hi-tech companies. In 1998 during President Clinton's As part of the APS delegation we met with US Ambassador to Ukraine, Bill Miller (center) To his immediate left is Judy Franz, executive officer, and furthest to the right is Irving Lerch who was the APS international director



Chornobyl Reactor #4 as it looked before it was covered.

I became an Honorary citizen of Slavutych.



visit to Ukraine, my work with the scientists from Chernobyl was cited as one of the benefits of American help. Many Ukrainian scientists and engineers lost their jobs due to the closing of the nuclear plant, and my small business incubator helped them start new lives. The mayor of Slavutych (town where the people from Chernobyl moved to after the disaster) named me an Honorary Citizen for my work and saving their town (see photo to the right) My most recent work in Ukraine was a two year program sponsored by the US State Department to help the deaf community. We provided them Western training and communication tools (computers, the Internet and distance learning modules). Much of that work is still ongoing. For my work in Ukraine I was honored by the Ukrainian National Academy of Sciences and made a foreign member.



In retrospective, I guess my mother's insistence that I learn and use Ukrainian proved critical to my success. I was glad that she was able to see her son visit his/our ancestral home after being away for nearly 50 years. I never believed that Ukraine would ever be free in my

lifetime, and it was like a miracle that suddenly it happened.

One of the things that really excited me was that by going to Ukraine I was able to do some genealogical research on my family names. One of the real moving moments was in finding a distant relative who was able to fill in many of the blank pages. He was equivalent to my great grandfather. He was nearly 90 years old but had a very sharp memory. He took me to the family cemetery and we spend a lot of time discussing the fate of many Gamotas that I was not even aware of their existence. Many were executed under Stalin or sent to Siberia. One cousin whose mother was Jewish died in Warsaw concentration camp. The photo on the previous page shows my distant great uncle and me sitting at the family plot near the city of Lviv where I was born.



In parallel to my work in Ukraine, I continued my benchmarking of foreign science and technology for the US government. One of the reports in 1996 was on nanotechnology and it was later used by President Clinton to start the National Initiative on Nanotechnology. My benchmarking work has also brought me to Japan many times in the 90's. More recently in 2001, and again in 2006 I was invited by the Japanese government to review their research programs. In 2005, I spend 5 weeks in New Zealand also at the request of their government to review and assess their research programs.

Going back in time a bit, in 1999, a seminal event occurred in the Gamota clan. Our first grandson was born. He lived in Washington DC, but since I was often on business in DC, it made it easy for Christina and me to visit him regularly. Grandma and grandpa were always there to "help". Later, my grandson and his family moved to London so we had to find excuses to go to London. Fortunately, for us grandparents, the family moved back to the states, and currently lives in Lexington, just a few miles from us. Then in April of 2003, another grandson was born, quickly followed by a third grandson in July (from another son and his wife). Finally in 2006, our last to date grandson was born. We are still waiting for a granddaughter.

In October 2007, I had the privilege of being invited to a Mike Sanders' 80<sup>th</sup> Birthday celebration. Many of his Minnesota and Michigan students came. A photo of the students/postdocs who came is shown below



Mike Sanders' 80<sup>th</sup> Birthday, October 2007 – Mike and his students/post docs. UMN indicates a University of Minnesota connection

Top left: Steve Whitmore UMN, John Magerlein, Jim Levine UMN, Stu Ryan, Jan Northby UMN, Gary Ihas, and Steve Forrest. Bottom left: Arnie Dahm UMN, George Gamota UMN, Mike Sanders UMN, Gabby Weinrich UMI, and Christie Zipfel.

I still go to Washington often and do my foreign technology benchmarks, but I don't travel as often and concentrate more on family and playing with my grandkids.



The Gamota Family - 2007



