

# Bob Benjamin Part One

(As published in The Oak Ridger's Historically Speaking column the week of December 15, 2025)

Benita Albert brings us another exciting story about someone who graduated from Oak Ridge schools and has an amazing career. Bob Benjamin's story starts with his arrival in Oak Ridge and quickly demonstrates his eager involvement in school activities. It is a refreshing story, for sure. Historically Speaking column readers will take pride in his reflections on our schools and teachers.

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As a young girl in the 1950s, I would frequently stargaze in the wide Missouri night sky above our family farm. I remember pondering how many twinkling lights I could see and marveling at the great distance between us, incomprehensible numbers for my basic arithmetic skills at the time.

By the 1970s I was a teacher of Calculus at Oak Ridge High School (ORHS), sharing infinite limit concepts with eager and brilliant students. And I remembered my young, star-counting days. In 1950, astronomers had estimated the number of stars as approximately 100 billion. In subsequent decades, the star count grew via advances in technology such as radio astronomy, more powerful optical telescopes, and space travel. The count now ranges between 100 to 400 billion, varying estimations based on parameters such as luminosity, mass, and size.

Now in the 2020's I have discovered that a former student of mine has "reached for the stars" in his career, not just metaphorically but also literally. Bob Benjamin is an ORHS Class of 1983 alumnus who has tirelessly worked to figure out what the Milky Way looks like. In a February 2024 *Scientific American* article, "Our Turbulent Galaxy," Bob is quoted: "The work isn't easy, because we're inside the galaxy and we can't see it from the outside, but astronomers have ingenious workarounds."

Part Two of Bob's story will reveal more of the exciting work in which he is involved as an astrophysicist and consultant for NASA. This Part One feature will reach back into his Oak Ridge roots and follow his educational path to astronomical discoveries.

John and Betty Benjamin arrived in Oak Ridge with sons, Bob and Jeff, in the fall of 1976. John began work at the Hollifield Heavy Ion Research Facility at the Oak Ridge National Lab. Bob described his father's work as maintaining the ion source and vacuum systems for the new particle accelerator. Bob and Jeff enrolled in Willow Brook Elementary in the sixth and fifth grades, respectively. The family became active in St. Stephen's Episcopal Church where John helped as a leader for Boy Scout Troop 128 and Betty was active as a church volunteer.

Bob recalled that the Ford/Carter Presidential election campaign was underway in the fall 1976, and he speculated that his support for Ford was perhaps due to his parents' Midwest origins. He said that presidential choice put him at the minority table during mock elections at his new school. Bob's younger years were spent in Long Island, New York, and in Connecticut, but he found there were many other 'transplanted northerner' classmates in Oak Ridge. He fondly remembers learning about Tennessee folk culture via Foxfire books and taking a school-sponsored overnight trip to the Smoky Mountains and visiting Cades Cove.

During his first year at Robertsville Junior High, Bob grew twelve inches. He wrote, "One advantage of that rapid growth spurt was that I suddenly had the longer legs for running, and I started track and cross-country in eighth grade at the urging of my best friend. In ninth grade I finished the Smoky Mountain Marathon on a snowy winter day. I was the first-place (and only!) participant in my age group. After that event, Coaches Lynn Burkey and Keys Fillhauer interviewed me on a community access TV show, which makes for hilarious (and still embarrassing) viewing."

Bob continued, "I excelled in classes at Robertsville and was voted 'Most Academic' for superlatives, but I could have also been voted 'Most Awkward.' I got jumped into an accelerated math track which meant that my ninth-grade math class was only five students. That class was memorable just because of its size and the freedom we had."

Bob described his ORHS years as action packed both in and outside of the classroom. The first year, his sophomore year, was special for the boys' cross country team's state championship in the fall. He wrote, "I was only junior varsity, but it was

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still fun. This was rapidly eclipsed by the achievements of the football team's state championship. As a reward, there was a community drive to send the football team to the Orange Bowl that winter. The football players got their own bus, but the cross-country team also got to tag along in a van. With Coach McNamee, I continued to run track and cross-country always hovering at the boundary between the junior varsity and varsity until I broke through my senior year in cross-country."

Later, in his undergraduate years at Carleton College, Bob continued to run track and cross-country in their NCAA Division III league. He reported, "I finally had a breakout moment where I set a personal best in the 1500m and qualified for conference finals."

Asked to recall his ORHS classes, Bob was full of praise for his teachers. French class with Sylvia Countess left a lasting impression, in particular, memorizing "La Marseillaise" which he says he still can sing. He wrote, "I know the rules for writing the perfect essay, even if I break them from time to time, thanks to English teachers Ann Johnson and Carol Yoakley." His sense of humor comes out in memories from science classes with teachers Eddie Anderson and Jackie Jacoby. He mused, "I recall using my highly fashionable calculator wristwatch with stylus to work out physics problems." And he praised teachers, Gene Pickel and John Shedd, saying, "They both excelled in making history come alive in very different ways."

Bob continued, "Apart from classes and sports, Model United Nations and the associated trips to Washington D.C. were also a great experience for me. I still have a fondness for the UN Committee on the Peaceful Uses of Outer Space."

"Although all these ORHS classes enriched my life and color my thinking to this day, the math classes turned out to be pivotal, particularly Calculus in my junior and senior years. When the teacher, Benita Albert, was absent during my senior year, she would ask me to run tutorial sessions for my peers who were taking Calculus. I discovered that I liked teaching. Although at that point, I didn't know what I wanted to do in life—so many options! I discovered that I enjoyed both learning and teaching math that last year in high school. And when I graduated, Mrs. Albert made me promise that I would take a math class my first semester. Things snowballed from there."

When Bob enrolled in Carleton College, he left his academic options open as to a major field of study. He wrote, "Up until the end of my sophomore year, I was equivocating between math/physics and political science/international relations, taking the required classes in both areas. But after a political science summer program in Geneva, Switzerland, where I wrote my term paper on CERN (the European physics laboratory), I settled on math/physics. I graduated *magna cum laude* with a double major in math and physics with 'distinction' in both majors. You had to do a summary research paper for each area. I did my paper on pulsars(physics) and Fast Fourier Transforms (math). Both of those ended up being useful in my future career."

I asked Bob why he chose to pursue an undergraduate mathematics major.

He answered, "I chose math as a major because I liked each math class more than the previous one. I remember writing letters back to Mrs. Albert about my math class experiences. It helped that all my math professors were colorful characters, as well as being committed to teaching; I was never bored. But I also felt that the most fun part of math was being able to apply it to real-world applications. Once I was introduced to the cool parts of physics-like special relativity and quantum mechanics-I was hooked. And then I took a single astrophysics class with Prof. Joel Weisberg that really captured my imagination; the idea that you could write down mathematical descriptions that could explain how stars, galaxies, and even the whole universe worked was mind-blowing."

"The summer before my senior year at Carleton, I did a campus summer project on geo-hydrology with math professor Loren Haskins while contemplating my future. I spent that entire summer vacillating between whether I should go to graduate school in physics or in astronomy/astrophysics. I wasn't sure what grad school was all about, but I knew that I wanted to learn more. One August morning, I woke up and just decided: astronomy. After four years of Minnesota winters-and with a tinge of homesickness for Tennessee-I decided to go to graduate school at the University of Texas at Austin."

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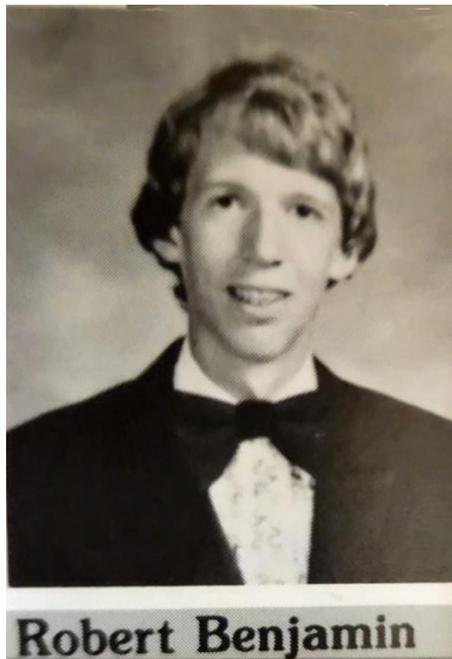
The summer before grad school found Bob back home in Oak Ridge and completing an internship at ORNL working in geo-hydrology with Dr. Laura Toran. He left Oak Ridge in August of 1987, unaware of how another 'star' would intervene in his move to Austin. Bob said he set out for grad school in his '74 Dodge Dart which was loaded full of all his possessions. A planned overnight stop in Memphis was thwarted by the tenth anniversary observance of the death of Elvis Presley. He said, "Every hotel for miles in all directions was booked. I had to drive well into the night, and deep into Arkansas, to finally find a place to stay."

Bob made it to Austin the next day, and he began a 7-year program in grad school, ultimately completing a PhD in astronomy in 1994. Postdoctoral studies furthered his research interests in the inter-stellar gas of the Milky Way, the fuel source for the next generation of stars.

Part Two of this story will take us to the stars, to the ever changing and evolving Milky Way Galaxy with Bob Benjamin as our guide.

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Thank you, Benita, for bringing us this insight into a student who obviously enjoyed his time in Oak Ridge schools. Reading about how he felt about the teachers was a compliment to the entire school's educational system.



Bob Benjamin when he was in Oak Ridge High School