

Marianne J. Dyson

A PASSION FOR SPACE

**Adventures
of a
Pioneering
Female
NASA Flight
Controller**



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This book is dedicated to the Apollo veterans and science fiction writers who inspired my passion for space, the teachers who equipped me with knowledge and faith to pursue this passion, and the men and women who continue to work behind the scenes every day to make space a place we can one day call home.

About the Author

Marianne J. Dyson was inspired by Apollo to become one of the first women flight controllers for NASA during the early space shuttle program. She has an undergraduate degree in physics and enjoys sharing her passion for space at schools, museums, and conferences. She has served as a technical reviewer for Scholastic, Enslow, National Geographic, and Hampton Brown. Her children's books have won the Society of Children's Book Writers and Illustrator's Golden Kite and the American Institute of Physics Science Writing awards and have been translated into multiple languages and excerpted for use in numerous state reading tests. A frequent contributor to *Ad Astra*, the magazine of the National Space Society, her science articles and science fiction stories for adults and children have appeared in national magazines and anthologies. She recently coauthored *Welcome to Mars* with Buzz Aldrin for National Geographic.

Preface

THE MOON LANDING, JULY 20, 1969

“Girls! Girls!” someone hollered from outside the big red barn. I was at Rambling Acres Horseback Riding Camp near Canton, Ohio. “Put your brushes away and come up to the house! They’ve landed on the Moon!”

I didn’t need a second invitation. I’d enthusiastically followed the space program since first grade, when John Glenn had orbited the Earth. I was 14 now, and I loved space even more than horses. That spring, I’d even hand printed a 60-page book, “The Apollo Program,” for my eighth-grade English class.

I dashed from the stall, latching the gate behind me, and ran up the dusty road to the camp owner’s house. “Wait up!” my best friend Chrisse France hollered as she scampered up the road behind me, followed by the other girls.

The owner, Mrs. Noll, insisted we brush dust and straw off each other’s clothes and remove our dirty shoes before entering her house. Then we filed into her living room and settled down cross-legged on the carpet, facing the television set. The TV was a box on legs about 3 ft tall with “rabbit ears” antenna. We crowded around the black and white picture.

The familiar face of CBS News anchor Walter Cronkite (1916–2009) appeared on the screen. In his deep voice, he explained that Mission Control in Houston had given Apollo 11 astronauts Neil Armstrong (1930–2012) and Buzz Aldrin (1930–) the “go” to exit their spacecraft. The men had been scheduled to sleep but were too keyed up after the exciting first landing on the Moon.

I was keyed up, too. It was the first day of camp, and I’d just met five new girls. We had plenty to talk about while we waited for the astronauts to leave the lunar lander. “Which one do you think is the cutest?” Sue asked me as we loaded our plates for dinner.

“It doesn’t matter,” I said, snatching a roll. “They’re married!”

Sue frowned and then sighed as she scooped beans onto her plate. “Wouldn’t it be dreamy to marry an astronaut?”

“Yeah,” I agreed. Then I added silently, “But even better if you could be one!”

We finished dinner, and the astronauts still hadn't emerged from their ship. We wondered what they were having for dinner. (I found out later, bacon cubes. Yuck!) [1] We trotted back to the barn for evening chores. I brushed the horse who shared my nickname, Red. Then we got our showers and returned to Mrs. Noll's house.

The television spurted static-filled voices of the crew talking with Mission Control. What was taking so long? Why didn't they just open the door and hop out? Bedtime came and went. Luckily, Mrs. Noll let us stay up for this historic occasion.

Finally, 6 h after Apollo 11 landed, the ghostly black and white "live from the Moon" image flickered on the screen. At 10:39 p.m. eastern time, Armstrong spoke the now-famous words, "That's one small step for a man, one giant leap for mankind," as he stepped backward off the ladder onto the lunar surface. I thought how I'd like to follow in his footsteps.

But in 1969, there was no such thing as an American female astronaut. No woman in my family had even gone to college. Yet, the previous winter, I'd written in my diary, "I wish very much to be able to be an astronaut. I'm sorry I'm a girl, but I'll have to try harder then."

As I gazed up at the half-full Moon that July night, I marveled that there were men up there looking back at me. If those men could walk on the Moon, then maybe a skinny red-headed girl from a small town in Ohio could find a way to go to college and one day work for NASA.

Houston, TX
March, 2015

Marianne J. Dyson

REFERENCE

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1

Space Girl Grows Up

In the book *Starman Jones* by Robert Heinlein (1907–1988), a boy wants to become an astrogator, a star navigator. “They” wouldn’t train him because he was an orphan. It wasn’t his fault he was an orphan. But young Jones prepares himself as much as he can. He memorizes his uncle’s “astrogator” books. He takes a job as a cook on a starship. The ship gets in trouble, the astrogator dies, and because Jones has the knowledge, he becomes the astrogator (and saves them all).

I saw myself in this character. NASA wouldn’t train women just because they were women. It wasn’t my fault I was a girl. So I’d study astronomy and then take whatever job I could get in the space program. I’d be ready if an opportunity for an “astrogator” came my way.

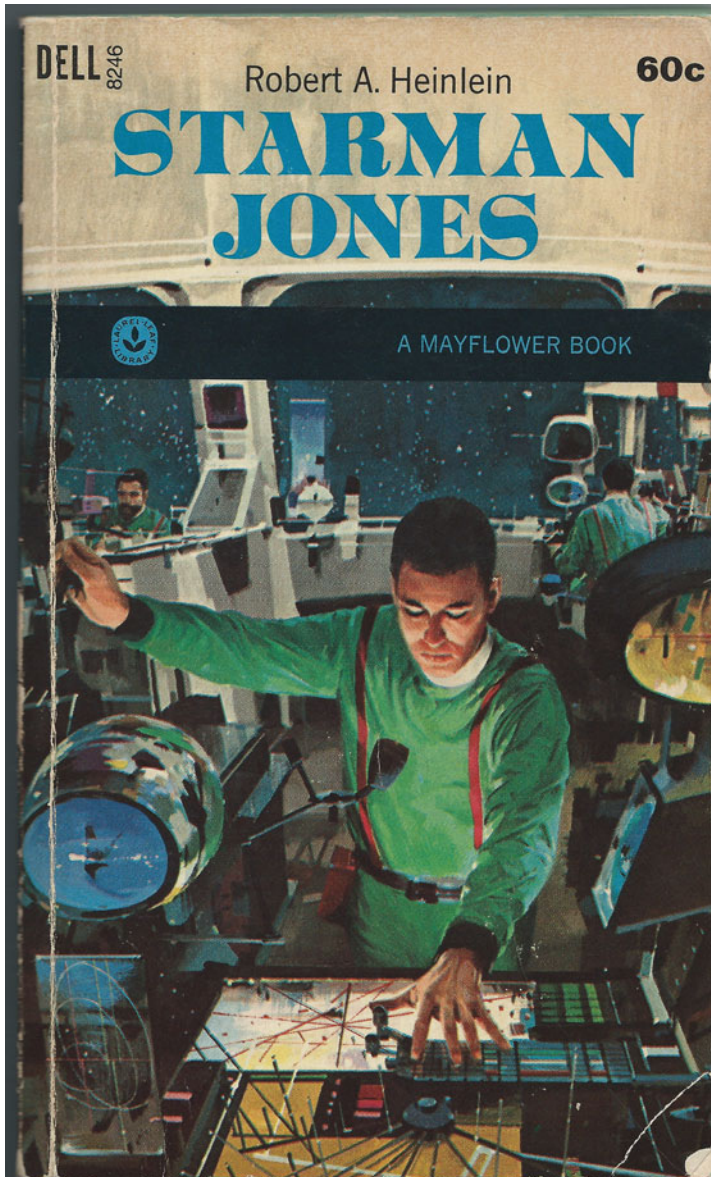
Like Starman Jones, I’d to have to train myself without much help from my parents. It’d been this way since the divorce, when I was eleven.

I’d just started sixth grade. Mom swears she told me the divorce was coming, but I hadn’t understood what it meant. So one day I came home from Edgefield Elementary in Canton, Ohio, and she was gone. While I was at school, she’d packed her things and moved out! I couldn’t even call her—she didn’t have a phone at her apartment. How could she just leave? As usual, Dad wasn’t home—he left for work before I got up and came home late most nights.

But I wasn’t alone. My brother Tommy, who had just started college at Kent State University, met me at the door. He told me not to worry. I’d see Mom again, just not at home. He noted that our brother Jeff, a high school freshman who had football practice after school, was also staying with Dad. I’d be okay. I nodded mutely and then went for a walk with questions scrolling through my mind. Who was going to make dinner? Who would pack my lunch and iron my dresses? Who would fix my hair and help me with homework? Who would answer my questions about boys!

Like Starman Jones, I was on my own. In these days before microwave ovens and prepared/packaged foods, I cooked dinner on the stove or baked it in the oven. Then I cleaned up afterwards. (We didn’t have a dishwasher.) If I wanted my dress washed and pressed (we didn’t have permanent press, and girls weren’t allowed to wear pants to school), I did laundry and then ironed everything. I’d always cleaned my small bedroom, but now I also cleaned the bathrooms and the kitchen.

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1.1 *Starman Jones* by Robert Heinlein inspired me to want to become an “astrogator.” (Cover by Berkey, © Dell Publishing, 1967)

Even though I didn’t want to do these “grown-up” things, at least I knew how. Mom had taught me well. I remember one night when Dad came home early and valiantly tried to make hamburgers for dinner. He got the stove too hot and filled the house with smoke. That won us a treat—dinner at McDonald’s! On the weekends, we’d make dinner

together. It was kind of nice to actually talk to my father about what I was doing at school while he and I made a batch of stew, and I baked snicker-doodle cookies for dessert.

I didn't talk about the divorce at school. I was embarrassed. My family was a failure, and I assumed I was at least partially to blame. I didn't know any other children whose parents were divorced. Other kids' parents were happy, like Ozzie and Harriet on TV, or so I assumed. My school didn't have a counselor, and we didn't attend church. So I just went on with my life, pretending as if nothing had changed. I dropped out of Girl Scouts because "it wasn't fun anymore," not because I didn't have time or a mother to drive me.

But I was angry. I wrote in my diary that I'd never forgive my parents for what they'd done to me.

My mother remarried the following year. She had met John (Jack) Wildey (1929–2001) at the Canton Player's Guild. I'd spent almost every weekend at the theater with her and my friend Chrissy, playing games with the props. My brothers both starred in productions, and I helped out backstage.

Surprisingly, my shy father (Tom R. Jakmides, 1922–2003) also remarried about a year later. A World War II veteran (he was a Lt. Col. in the army), he worked on military contracts for Goodyear Aerospace in Akron, Ohio, and often traveled to Washington, D.C., on business. On one trip, he met Donna Wolfe at a party.

I'd been "on my own" for almost a year when Donna moved in just before school started in 1967. I'd expected her, being the woman of the house now, to take over my chores. But Donna taught school and expected me to "do my share." She did take over dinner—but she was a worse cook than Dad! Why had Dad married her?

Within a year, Donna was pregnant. My mother was finished having kids—she was 38 when she and Dad divorced. He was 45. But Donna was only 29 when she married Dad.

Donna quit work after Carolyn was born in 1969, five months before *Apollo 11*. With Donna home more, she and I argued constantly about use of the phone (there was only one and no call waiting), noise (don't wake up the baby!), pets (the cats weren't allowed in the house), cleaning (why is it my job to wash your dishes?), etc. Donna and I were both happiest when I spent school breaks with Mom and Jack. After Mom moved to Johnstown, Pennsylvania, my freshman year, Jack invited me to move in with them. But I didn't want to change schools.

Not that I had many friends at Glenwood High School. My brother Jeff, who was a football player and quite popular with the girls, asked me why boys weren't calling for dates. "You're not even ugly," he noted. I joked that I was too smart for the boys my age. Girls weren't supposed to be good at math, and I actually liked math. I got A's in almost everything. Boys were uncomfortable around smart girls, and especially me, ever since the fourth grade.

When I was in fourth grade, the Plain Local School District administered an IQ test. The test was to identify children for enrollment in an experimental gifted program.

As far as anyone at Edgefield Elementary knew, Marianne Jakmides was just another somewhat above-average student. I'd noticed that getting all A's didn't win me any friends. So I didn't apply myself. When my social studies grade slipped to a D, Mom said I could do better. But no one seemed terribly upset.

A few weeks after the IQ test, one of the boys found out that our teacher had the results. "Mrs. Wolf! Tell us who's the smartest! Who has the highest IQ?" They bugged her all morning. She told them the results were secret. After recess, the boys badgered her even

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more aggressively until she said, “Well, I suppose it’d be okay to tell you who got the highest score.” She glanced in my direction. “The highest score in the fourth grade was Marianne Jakmides!”

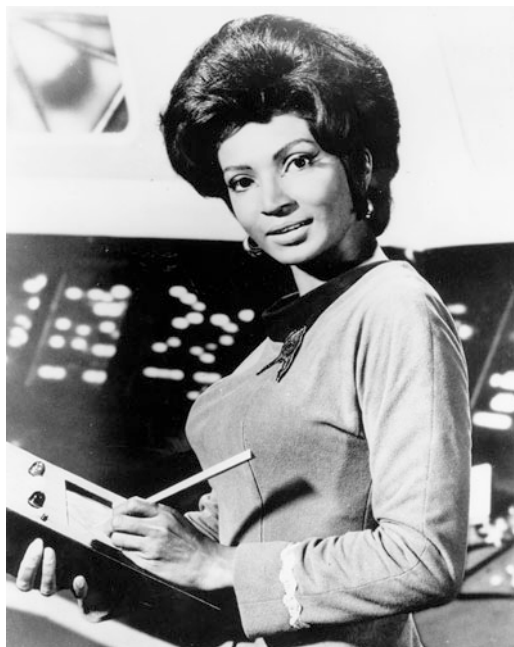
“No way a girl is smartest!” the boys insisted. “Who’s really the smartest?” Mrs. Wolf added that Tom M. had the highest score of all the boys.”

While being labeled “smarty pants” didn’t help my popularity, knowing that others thought I might have the “right stuff” did help me think that I could emulate Starman Jones.

As a result of the test, I was placed in a special class of about 30 students in seventh grade at Taft Junior High. We covered material at a faster pace than all the other classes. My 7th grade science teacher, Mr. Brady, even let me do experiments. In ninth grade, I tested the burning properties of a bunch of fabrics and won the Taft science fair. My 9th grade science teacher (Mr. Zeigler) then asked me to take a science aptitude test. I got a top score.

At Glenwood High School, I got A’s in algebra, trig, and geometry. I learned a little about these new devices called computers. I got A’s in biology and chemistry. I noted that astronauts needed leadership experience, so I got elected to Student Council. I was inducted into the National Honor Society as a junior. But despite my stellar academic performance, no teacher or counselor suggested I consider a career in science, or any career at all.

I didn’t know who to talk to about my dream of working for the space program. I’d never met a female scientist. My role model was fictional: Lt. Uhuru (played by Nichelle Nichols) on Star Trek. Maybe I could be the communications officer on the bridge of a starship!



1.2 Lt. Uhuru on Star Trek (played by Nichelle Nichols) was my role model (NASA photo)

When I asked the counselors for advice on how to prepare for a job at NASA, they didn't take me seriously. They suggested bookkeeping, shorthand, and typing. Starman Jones had been a cook. Maybe my way in would be as a secretary? I made sure to get an A in Office Skills.

I tried to follow the rest of the Apollo missions to the Moon, but football was more in the news than space in Canton, Ohio, the home of the Football Hall of Fame. I did hear about *Apollo 13*'s emergency, though. I loved how the men in Mission Control had used their knowledge of spacecraft to find a way to rescue the astronauts. If women couldn't be astronauts, maybe I could be part of the team that solved problems for them? That would be a cool job!

I was thrilled when Dad brought home posters of Neil Armstrong and Buzz Aldrin on the Moon. They went up on my wall near the poster of Peter Tork (1942–) of The Monkees.

Life at home got a bit complicated my sophomore year. Not only was there a new baby in the house, but my Dad's mother, Grandma (Eunice, "Jackie") Jakmides, moved in with us.

Grandma told stories about growing up in Alabama with her brothers who were railroad men. One of them was a redhead, which explained how I got my red hair even though my father looked like his Greek father. She and I both loved horses. She talked about how she broke her arm falling off a horse as a teenager. As soon as she healed up, she'd gotten right back on that horse and promptly broken the same arm again! We laughed about being stubborn ladies who didn't give up. I told her I wouldn't give up on going to college and working for NASA.

Grandma Jakmides died of heart failure just after my 16th birthday on January 2, 1971. Without her as a confidant and buffer, Donna and I argued constantly, mostly about the new house she and Dad had bought. "We're moving? But I don't want to move! Will there be any money left for me to go to college? You're getting a sheep dog?"

Mom thought if I moved in with her, Dad wouldn't pay for my college. She urged me to tough it out. That's what Starman Jones would do. It was only for two more years. But I was anxious to gallop away.

Many nights, I'd wait until everyone was asleep, climb out a window, and walk to calm my nerves. One February night after yet another argument with Donna, I thought I'd just keep on walking. Why should I go back? They'd be happier with me gone. The snow pelted my old coat, and my hands were cold despite the mittens jammed into my pockets. I could walk to the bus station and buy a ticket with my babysitting money. Let them wonder where I'd gone, beg me to come home. But what about school? If I dropped out, I'd never work for the space program.

I walked to a favorite spot—a clearing on top of a hill in a nearby cemetery. Perhaps I should've been afraid, a teenage girl alone at night, but I wasn't.

I directed my conversations toward the star Sirius in the Constellation Canis Major. Sirius is the brightest star in the sky, so since I'd first spotted it by standing on my bed as a little child, I'd assumed God lived there. I imagined that its twinkling light was a kind of code that I'd understand once I became an astronomer.

Although I'd said prayers every night as part of my bedtime "ritual," we didn't belong to or attend any church. My mother held a grudge against the Church for not helping her as a teenager. My father had distanced himself from his Greek Orthodox heritage (his father

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arrived on Ellis Island, NY as a teenager) to avoid the “immigrant” stigma while growing up.

I joined a Presbyterian church on my own in 7th grade. The father of one of my friends was the pastor. I took the bus after school to her house, and we went together every Wednesday. But after she moved, I didn’t have a way to get there. So church for me was reading the Bible that Grandma Jakmides had given me. I’d read it cover to cover several times, but I still didn’t know what to do about Donna, the move, or boys.

As I stood there on the hill on that cold snowy night, I asked God to show me what to do. Sirius winked and blinked in the cold night air. I felt that God had a plan for me. Running away wasn’t the answer. I went home determined to “tough it out.”

Soon after, in drivers’ education class, I met a hippie carrying a Bible. He’d been to Woodstock the year before—“the” music festival of my generation. Mike Covert was part of a new movement called the Jesus People. We took walks in the park and talked about life, love, and the universe. My new “church” was a picnic table where me, Mike, “brother” Scott Holland and some others read the Bible and discussed it.

Those years of fellowship and independent study kindled my faith in a God that would always be there for me even when friends and family weren’t.

But I kept my guardian angel busy! In the fall of my senior year, my boyfriend Jay H. and I went bareback riding. The gelding I was riding took off for a fence that I assumed he planned to jump. The horse totally ignored the attempts by this 95-pound girl to turn or slow him down. Rather than risk being impaled on a fence post, I decided to do a controlled fall the way I’d been trained. I slid down his leg and went into a spin, but WHAM and WHAM again, I hit that packed dirt road like a suitcase dropped from an overpass.

Afterwards, I couldn’t move my legs. My left ring finger was bent sideways. Jay carried me to a nearby shelter and got the car. He met my father for the first time at the emergency room. My back was “merely” sprained.

By January, I felt fine except for this growing lump on my tailbone. I mentioned it to my doctor. He took one look and scheduled me for surgery to “have my tail removed.” He said if the cyst on my tail bone burst, I’d be paralyzed. Yikes!

I had the surgery and missed a month of school. I remember lying in bed listening to Rod Stewart’s song, “Maggie,” and thinking yes, it really was “time to be back at school!”

I graduated from Glenwood High School 19th out of a class of 400 in 1973. My friend Marilyn DiMaio and I decided to be roommates at Ohio University (OU) in Athens, Ohio. I declared myself a math major. Marilyn chose French. We parted for our summer jobs. I went to Charlotte, North Carolina, where Mom and Jack had moved that spring.

OHIO UNIVERSITY

The week before I was to report to OU, I discovered that my tuition and board hadn’t been paid. I called my father. “I’m sorry honey, but I don’t have any money for you,” he said. What! I asked him why not. He noted that my brother Jeff was in college, too. I knew Dad considered it more important for my brother, being a man, to get a college degree than it was for me. But why hadn’t he warned me? Had I toughed it out with Donna for nothing?

I sat in my mom’s kitchen staring at the phone in shock, my dreams of becoming an astronomer as impossible as the warp drive on the Starship Enterprise. My summer job at

Carowinds had only netted enough money for bus fare and textbooks. What was I going to do?

That night at dinner as I picked at my food, my stepfather Jack put his hand over mine and said “Your mother and I are going to pay your tuition.” It was the second shock of the day. Jack, a title lawyer, had been laid off the week before, a victim of a recession in the construction industry. They’d sunk all their money into the new house and had almost no savings. Without a job, Jack couldn’t afford the mortgage payments. He wasn’t just giving me some money. He was giving me all he had. He insisted I accept it. “You are my daughter, and I want you to have it,” he said. Not his wife’s daughter, or his stepdaughter, his daughter. Whatever else Jack may have done right or wrong in his life, in that moment, he changed mine forever.

The dorm room was barely big enough for twin beds. The bathroom and showers were shared with the rest of the floor. But Marilyn and I loved it. I was on my way to the stars!

To help with the next quarter’s tuition, I took a job at the OU Music Library. I played guitar at a local coffee house for tips. I set that money aside to buy a banjo kit that I built myself that spring. A banjo picker gave me lessons in exchange for pottery I made in ceramics class.

But like a lot of freshman, I had difficulty adjusting to college life. I’d never had to study in high school, and I’d signed up for astronomy, calculus, French, philosophy, and literature courses that all required a lot of homework. The Latin I’d taken in high school didn’t help me at all with French. I got a tutor and managed to eke out a C with help from Marilyn.

I got A’s and B’s in my other courses, despite misunderstanding that calculus—which I was taking at the same time—was a prerequisite for astronomy. When Dr. Godecke learned of my ambition to become an astronomer, he worked with my calculus professor, Dr. Denbow, to prepare tests for me that only required the calculus I’d had so far. Years later, when I joined NASA, I wrote him a letter thanking him for the opportunity to be in his class. Thanks to him, I saw Comet Kohoutek that spring and considered it a good omen for my future.

But calculus was a struggle. All through high school, I’d been in an experimental math program that was self-paced and self-taught—we took tests every six weeks to show our progress. I’d gotten used to spending as much time as I wanted on a topic before taking a test. Unfortunately, college required me to learn on a schedule. So I fell behind my second quarter, with my B slipping to a C in calculus. Dr. Denbow took a look at my course load, and the fact I had a job in the library, and suggested I replace the last quarter of astronomy with something less taxing. So I signed up for voice lessons (which I’m sure the coffee house regulars appreciated!). My math grade improved, and I made the Dean’s list.

By the end of the year, it was clear that I couldn’t stay at OU. The college required freshman and sophomores to live on campus. Jack now had a minimum wage job. They’d sold their house in Charlotte and moved into an apartment in Chapel Hill, NC. Mom had gone to work, too. They’d paid my tuition and board for my entire freshman year. But their savings were gone. Even if I worked all summer and saved every penny, it wouldn’t be enough. The school said I didn’t qualify for college aid because my father made too much money. It didn’t matter that he wasn’t spending it on me.

Mom suggested I apply to the University of North Carolina and live with them. So I sent an application. With my good grades, I was sure they’d accept me.

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Before I left for North Carolina, I decided to visit my brother Tommy, who had married his girlfriend from Kent and settled in California. He and Martine were expecting their first child in June. I found a ride off a bulletin board and planned a trip to San Francisco.

My next-to-last weekend at OU, a friend begged me to go for a ride on his motorcycle. I'd told him no all year, because a high school friend had lost a leg in an accident. But he made the case that the weather was perfect, the country roads deserted, and he'd not go faster than 30 mph. I gave in. The rolling hills around Athens were just as beautiful in the moonlight as he'd said. But at the bottom of a hill, the bike slid sideways on loose gravel. The bike tipped and slammed me to the ground. My foot was crushed under its weight.

CLOSE ENCOUNTERS

With a cast to the knee, I caught a ride to California. The driver was a nice Irish exchange student named Gilbert who wanted to see America. But the other two passengers were rather suspicious-looking. One had a black eye, and the other was sick and pasty-looking. The former, John Wilhelm, said he'd gotten the shiner at a graduation party—he'd just earned his degree in business. The latter was actually going through heroin withdrawal. By the time we reached Colorado, he confessed to being an escaped convict, too.

The car was an old junker, and the Rocky Mountains proved too much for it. The engine overheated and quit. Stranded by the side of the road between Boulder and Estes Park, a stranger picked us up and let us spend the night in his cabin. Worried about our addict companion, I snuggled up with John. By the time we got to San Francisco, he was talking about coming to North Carolina, and I was encouraging him.

I stayed in California a few weeks, visiting my brother and my newborn nephew, Patrick. A doctor in Berkeley removed my cast and then told me I needed another cast. I didn't have any money or insurance. So the doctor handed me some crutches and said to stay off the foot for three weeks. I made a little "sympathy" cash playing my banjo on the street corner that week.

To get to North Carolina, I posted a "Ride Wanted" note on a bulletin board at Berkeley. A banjo picker offered me a ride as far as Nashville. A high school friend, Jeff Neuwirth, had shown up in Berkeley while I was there, and gave me the number of a friend named Dan to stay with in Nashville.

I'd never been to Nashville, so I asked Dan to drop me off at a famous place called the Pickin Parlor while he went to work. A man there asked if I wanted to see how they made banjos. "Yes!" I replied. I wanted to improve the one I'd built. After seeing how they did fancy inlays and stretched the drums, he offered to show me the recording studio. I was so interested in the equipment that I didn't realize he'd locked the door. He spun me around with a smile on his face. "Don't worry girl, you can scream all you want. This place is completely sound proof!"

If this were "Star Trek," Capt. Kirk would come to rescue me. But this was the real world, and I needed to rescue myself. A friend had told me that nothing turned a guy off faster than a woman crying. So I turned on the tears. I told him how I was a Christian and saving myself for my husband. He ran his hands over me and said a Christian girl wouldn't dress like a "hussy," making a man all crazy. In my head, I realized he had a point—I was

wearing white shorts and a blue halter top. I looked down at myself and shook my head like I'd never noticed my body before. "I'm so sorry!" I sobbed. "It's real hot out today, and I, well, I didn't think. I'm just a dumb teenager!" My heart was about to pound out of my chest.

"How old are you girl?"

"Seventeen!" I lied. I probably looked even younger. I was actually 19.

"Oh Jesus," he cursed. He pushed me away. "Don't you be coming 'round here again!" he shouted. He stalked out and left the door open.

Shaken, but thankfully in one piece, I rushed out to the nearest phone booth and called Dan. He speculated that a lot of women went there to court favor from the staff to land a singing gig at the parlor. The guy probably mistook me for just another groupie. I winced. If I wanted NASA to take me seriously, I'd better learn how to dress.

I'd had enough adventure for one summer. I called Mom. She lectured me about how dumb it was to be hitchhiking across the country. She bought me a ticket on a Greyhound bus.

UNIVERSITY OF NORTH CAROLINA

When I arrived at Mom and Jack's, I found a letter from UNC saying that they didn't accept transfer students. But my academics qualified me to be admitted to one of the branch colleges. The nearest one was UNC-Greensboro, formerly Greensboro Women's College. Could I find a cheap apartment within bike distance of campus? A part-time job? Mom promised to help with food and clothes, and Dad had sent me his "poker winnings" to cover a rent deposit.

We arrived at the registration office. The counselor said that not all my credits from OU would transfer. But I could still graduate in three years if I attended summer school. That sounded okay. We just had to pay tuition and fees. My mother paled at the sight of the bill. It was more than I'd paid at OU for both tuition and room and board!

The counselor explained that I was an out-of-state student because my father lived in Ohio. Mom explained that she and my stepfather had been residents for two years and that I lived with them except for when I was at school. But the counselor said that IRS records showed my father had claimed me as a dependent on his taxes. That made me an Ohio resident.

"But my father didn't support me!" I declared. "He said he was going to pay for my college, but he didn't!" Tears rolled down my cheeks. My college dreams were once again shattering. Mom was angry. She said I moved to North Carolina with her—that I had worked at Carowinds the summer before my freshman year, and that she paid my tuition at OU. Wasn't that proof enough for residency? The counselor asked us to wait while she talked to her supervisor.

As we waited, Mom assured me that we'd figure it out. I could live with them and get a job while I established residency. But I sensed her deep worry that if I interrupted my education, I'd never finish. I didn't know it then, but she hadn't finished high school because she'd gotten pregnant. She knew that once I dropped out, it'd be a struggle to go back and finish.

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The counselor returned and said the rules weren't intended to make things harder for children of divorced parents. The registrar agreed that it'd be a shame for me to drop out because of custody issues that I had no control over. So they'd admit me as an in-state student!

I found a job selling cigars and making sausage biscuits at the breakfast counter of an Eckerd's drug store. I reminded myself that Starman Jones had been a cook. It was honest work while I prepared for my future job as an astronomer/astrogator. For \$65 per month (about \$325 in 2014), I rented an apartment in a poor neighborhood—no air conditioning, no screens on the windows, no ceiling fans, no carpet, and enough mice to cover the meatloaf keeping warm in the oven. Yuk!

To help with the mice, I adopted a wild gray tabby kitten (who had been hiding under the building) and named him Lenny.

With minimum wage at \$2.00 an hour (equal to \$10 in 2014), I had to work almost full time for me and Lenny to live in that dump. I was often awakened by flashing lights as the police came to question the local drug dealer upstairs. One morning I heard a crash and squeal and discovered an irate squirrel had fallen through the ceiling and was tearing up my bathroom. Too much of a challenge for Lenny, he and I waited outside until the squirrel found its way out through the living room window (which had no screen). But living in the slum was okay as long as I was back on the road to space!

Dr. Godeke at OU had advised me to major in physics and go to graduate school in astronomy. So, I changed my major to physics, without ever having taken a physics course.



1.3 I transferred from OU to UNC-Greensboro and became a physics major without ever having taken a physics course (Photo by the author)

Despite UNCG being mostly a women's college, I was the only woman in the Physics Department. I quickly made friends with two other physics students, Tom Alspaugh and

Tom Burkhalter. They both became good friends and study partners, but not boyfriends. I'd "imported" a boyfriend from OU—John Wilhelm, the man I'd met on my trip to California.

John's parents were well-to-do members of Baltimore society, and practically disowned him when he moved to North Carolina. When I lost my roommate in the middle of the semester, John paid her share of the rent—and moved in. In their eyes, I was now a "white trash tramp" who had corrupted their son. (They warmed to me after they met me in person.)

That first physics course at UNCG was a revelation. Dr. Clifton "Bob" Clark taught me about a world of light and heat and sound that I hadn't noticed before. The leaf falling off the tree was slowed by air pressure. A candle burning converts matter into light and heat.

Unfortunately, like calculus the year before, I got a C in that first physics course. Dr. Clark called me to his office. "Are you sure you want to major in physics?" I explained about my dreams of being an astronomer. "Well," he said, "if you're going to be a physics major, you're going to have to do better than a C." Uh oh. He was head of the Physics Department. He could end my career before it really got started.

However, he had no intention of doing that. He wanted to help. He suggested that I get some practical, hands-on experience with science. Sample problems in the books assumed student familiarity with gears, motors, belts, and axles—things male students easily imagined. They'd taken machine shop, worked with tools, played sports, and helped their fathers repair cars and appliances all their lives. I'd never even put gas in my father's car. Male gas attendants did that!

Dr. Clark therefore recommended I join the local astronomy club and build a telescope. He signed me up for electronics and optics lab courses. With help from Dr. Gerald Meisner, we started a chapter of Sigma Pi Sigma, the Society of Physics Students, and built a windmill. Dr. Gaylord Hageseth had me interpret bubble-chamber photos to determine which charged particles had been produced by various interactions. I had a blast! I became the secretary of the Greensboro Astronomy Club and even appeared on local television. Hands-on was the answer for me. Physics wasn't an abstract science—it was how the world and everything in it moved. My physics grades rose to B's and then to A's.

To add to my practical skills, I participated in some ground-breaking vision research in the Psychology Department that led to my first scientific paper, "A Pilot Study on Classification of Two Attended Stimuli," about the brain's response to shapes while the person is or isn't paying attention to them. Even though it was never published, my professor praised the work and gave me credit as part of my grade. I felt like a real scientist.

By sharing a house with six other women my junior year, I reduced my rent. I also earned more per hour by working for Big Star grocery, a union store. As long as I paid my dues and attended the AFLCIO meetings, I got good hours and all the day-old bread, bruised fruit, and dented canned goods I wanted. But it was a far cry from the bridge of the starship *Enterprise*.

My grades were good, but I knew I could do better if I had more time to study. I wanted my grad school applications to win me a scholarship. I asked Dad if he'd pay my tuition for the spring semester. He said he'd been lucky at poker, and sent me about half the money I needed. It was enough for me to cut my work hours in half. I got all A's that semester.

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1.4 My boyfriend John took me on my first tour of the Smithsonian Air and Space Museum. I wanted to ride on Polaris like Tom Corbett of the Space Cadets! (Photo by the author)

John finally gave in to his parents and took a “respectable” job in D.C. So the summer before my senior year, I took a job as a counselor for autistic children at a camp in nearby Maryland. The children were part of a psychological study to see if behaviors learned in a structured setting would hold up in an unstructured camp environment. I had to remember to always put the toothpaste and brush in the same location, to help them dress in a certain order. This job was actually good training for writing procedures for astronauts!

Soon, the summer of 1976 ended. To keep me company back at school, John bought me the best gift ever—a Persian kitten. Jasper Kitty was my companion for the next nine years.

In May 1977, I graduated cum laude with a degree in physics and minors in math and psychology. Even better, I’d received a fellowship from Rice University’s Space Physics and Astronomy Department in Houston, Texas.

CONGRESSIONAL INTERN

Immediately after graduation, Jasper Kitty and I moved in with a childhood friend of mine, Leslie Schworm, in Washington, D.C. I'd been selected for an amazing summer job.

I was an LBJ (Lyndon Baines Johnson) Congressional Intern for the Honorable Ralph Regula (R-Ohio, 1924–). He was on the powerful House Appropriations Committee (which he later chaired). He and his wife Mary treated me like a princess, inviting me to dinner in their home and arranging for me to meet my Ohio senator and childhood space hero, John Glenn. I had tea with him and his wife Annie at the Senator's office. He kindly signed a photo for me.



1.5 I worked for Congressman Ralph Regula as an LBJ Congressional Intern in the summer of 1977 (Photo by the author)

I reported to the Longworth House Office Building each day and then attended hearings of an energy bill working its way through Congress. I read about the pros and cons of nuclear power and other sources of energy in the Library of Congress, the most