

Welcome to Space

From ignition to weightlessness, an excerpt from Dr. Seddon's autobiography on her journey of a lifetime by Dr. Rhea Seddon



TOP Dr. Rhea Seddon. Learn more about [Dr. Seddon](http://astronautrheaseddon.com/) at <http://astronautrheaseddon.com/> (Photo courtesy of NASA)

We boarded the ancient, rusted metal elevator that had whisked Apollo and earlier shuttle crews before us to the tops of their rockets. Along with the launch pad itself, the elevator had withstood the rocket blasts from blazing spaceships for almost two decades. Up we went, all the way to the 195-foot level where a walkway led out to the White Room, a small antechamber at the end of the retractable arm that snuggled up against the crew hatch. It was a cool, damp spring morning with drizzle starting to fall. As I waited for the crew compartment to be readied, I walked out on the gantry way and saw the first faint light of dawn to the east over the Atlantic. The vehicle hissed and groaned as various fuels and gasses were loaded on-board. *Discovery* had come alive.

One by one we crawled through the open hatch and snaked to our seats. With the orbiter tipped with its nose skyward, our seats lay on their backs and everything looked odd. Like a car upended, the dashboard was above us and the floor was vertical. I walked on temporary platforms laid across the rear cockpit windows. The experienced hands of the suit technicians guided us in the right direction. Lead Tech Al Rocheford, who had overseen all the strap-ins since the Apollo days, awaited us. He anchored us to history.

As I eased into my seat on the flight deck, my hands fluttered around, trying to be helpful with my seat harness. The tech helping me tapped me on the shoulder, sighed, and patiently looked me in the eye.

"Go limp," she said. The voice of experience.

With all the preparations completed, the last of the techs patted the commander on his helmet, waved, and disappeared out the hatch. There was never a greater sound of finality than the CLUNK of the shuttle hatch closing. Suddenly, it seemed quiet. It was now too late to get out. Even in the practice countdowns they had never closed the door.

The final countdown preparations swirled around us and below us. The Orbiter Test Conductor requested that either our Commander (Bo Bobko) or Don Williams (our

Pilot) reposition certain switches, check certain meters. As the clock passed our planned launch time, he let us know what was obvious out our cockpit windows – that the weather was no good. The dawn had revealed what the weatherman had predicted – low, gray clouds obscured the sky. Occasional sprinkles of rain passed across our windshield. A typical spring day usually included vultures catching warm updrafts of air to circle the pad. Not today. On April 12, 1985, they stayed home.

The countdown continued until the nine minute hold, a built in stopping point where all the systems were in a good configuration for launch but could wait for several hours. We waited a long hour, uncomfortable in our hard seats, our bladders filling, dozing, and going over the procedures we would need to perform in space. As we checked our watches, it became clear that if we were to get off the ground before the end of the launch window, the decision would have to be made soon. As if on cue, the test conductor came on the line about one minute before we needed to pick up the count.

"Commander, what would be the best way to get this thing off the pad today?"

"We could pick up the count," Bo said, almost quizzically.

"Roger, Commander. Launch Team, we will pick up the count on my mark in 30 seconds. *Discovery* crew, good luck! Have a good flight!"

I was stunned and thrilled as the clock began counting downward. The Launch Control Center personnel were checking each system. Our on-board computers were ingesting thousands of bits of information each second. It was as if some giant chain reaction was getting bigger and bigger racing, beyond my control, toward an explosion. All I could do was "go limp."

I could see the gaseous oxygen vent arm, the "beanie cap," swing away from the nose of the big, orange external tank. The fuel tanks were now pressurizing. I could feel the far away vibrations of our main engines repositioning themselves. The calls from the test conductor, and Bo's and Don's answers, became more rapid-fire and clipped. Time



LEFT The crew of space shuttle *Columbia* STS 40. After Dr. Seddon's successful mission in 1985 aboard the space shuttle *Discovery*, which is the subject of her memoir excerpt, she served on *Columbia* STS 40 in 1991. (Photo courtesy of NASA)

seemed to compress.

At 31 seconds to go, our on-board launch sequencer took over automatic control. The personnel in the launch center ran through their last second checks. The on-board sensors fired rapid bursts of data at our computers. If at any point something wasn't right, the launch sequence would halt.

Sixteen seconds before lift-off, a huge waterfall at the base of the launch pad activated to dampen the reflected sound vibrations about to belch forth from the boosters and engines. Three hundred and fifty thousand gallons of water gushed into the flame trench below.

At launch minus 10 seconds, the ground's launch system sent its final command to *Discovery*: *GO for main engine start.*

We were on our own now.

Just before the chain reaction reached critical mass, I turned my head to the left to watch the launch tower out the side window. At launch minus 6 seconds we felt the deep, throaty rumble of the first main engine igniting. Then in rapid sequence the second and the third. Boom! Boom! Boom!

As expected the firing of the engines caused the tip of the rocket to sway backward about two feet. I knew the booster hold-down posts would be groaning with the strain of the tilt. Slowly the vehicle swayed back upright. I knew that when it pointed straight up the eight explosive bolts on the hold-down posts which attached the two boosters to the launch pad (and us to the earth) had to fire at the precise millisecond that the boosters themselves ignited. If there was any hang-up in that

choreographed timing, if the bolts didn't separate cleanly, or if one of the boosters hesitated, there would be a horrendous cataclysm in which all of us and the vehicle would be blown to bits.

Lift off!

The split second I felt the bone-jarring blast from the boosters, my gaze shifted from the launch tower, which had vanished from the window, to my hands in my lap. From the noise, vibration, and acceleration, I was sure the shuttle had blown up, and I was about to watch my body disintegrate. That fearsome thought was interrupted by Bo's call as we cleared the tower, going upward now at over a hundred miles an hour.

"Houston, *Discovery*, roll program."

We were on our way! I was alive!

"Roger, roll, *Discovery*!" responded our Capcom, the Astronaut communicator in Houston's Mission Control which had taken control of our flight at lift off. As we went through the rain, little rivulets of water collected and danced around the edges of our windshield. We broke through the gray of the clouds and could see blue sky and sunlight above us. I craned my head around to look out the overhead window but was disappointed to see only gray cloud tops below us, so uniform that it was hard to tell if we were one mile or a hundred miles above them.

The early ride on the boosters was teeth-rattling, more intense than I had ever experienced in the simulator. This was for real.

Two minutes after launch at an altitude of 150,000 feet, there was a sudden forward lurch

and the flash of an explosion out the forward windows. The boosters blasted themselves away from the tank, having burned up two million pounds of propellant. After that I wondered if we were still flying, it was so smooth and quiet.

The main engine instruments signaled everything was working as expected, and the gentle push skyward continued. Almost imperceptibly at about seven minutes after launch, the G-forces began to press down on my chest as the acceleration to orbital velocity continued. Somewhere around eight minutes the crush reached the maximum of 3-Gs—three times the force of gravity—and became uncomfortable. Difficult to breathe, to talk, to move my arms or turn my neck, I was comforted to know this would last only about 30 seconds.

And then it happened. At over 25,500 feet per second, more than 17,000 miles per hour, and at 250 miles above Mother Earth, we reached the point of "Main Engine Cut-Off." The acceleration stopped, and we lurched forward against our harness straps. Gravity disappeared.

An errant bolt drifted up from behind the instrument panel beside me. Pencils, books, our arms, sparkling dust particles – everything – was adrift. Since we had expected and trained for this moment, all of our equipment including books and pencils were tethered. They wouldn't float far away from us, but, oh, the wonder of seeing them unfettered by earth's pull.

Dave Griggs, sitting in the seat next to mine, turned to face me, and his enormous smile mirrored mine. Bo said the words we had all waited so long for:

"Well, rookies, welcome to space!"



LEFT Launch of space shuttle *Discovery* – STS 51D (Photo courtesy of NASA).

Her Amazing Journey

A conversation with doctor and former astronaut Rhea Seddon by Kory Wells

“I don’t think I ever took risks for fun,” says Rhea Seddon as she looks up from a quick check of her buzzing cell phone. In contrast, her husband is at the Reno Air Races, she explains, and after last year’s crash that killed a pilot and ten spectators, she appreciates his messages to let her know he’s alright.

Seddon, with a quiet confidence and measured, intelligent manner, is no worrywart, and she’s no stranger to risk herself – at least for professional purposes. Although her petite figure and youthful, blue-eyed blonde looks somehow belie it, Rhea Seddon, MD, has a history of strapping herself into rockets and orbiting the earth in the name of medical science. One of the first six women chosen for NASA’s astronaut program in 1978, Seddon flew on three missions, deploying satellites, serving as Payload Commander, and conducting life sciences research, among other tasks.

After nineteen years with NASA, Seddon went on to serve as Assistant Chief Medical Officer with Vanderbilt Medical Group, where she applied her experience to patient safety and quality of care. Now she devotes her time to speaking and consulting. I had the pleasure of sitting down with her in her Murfreesboro, Tennessee, home to talk about her experiences and her progress toward one of her long-time goals of writing and publishing her remarkable story.

Kory Wells: You’re not an air racer, then?

Rhea Seddon: I would never do air racing. And I probably would never jump out of an airplane just for fun.

KW: I always thought I wanted to do that – until my first time up in a small plane!

RS: There were parts of flying lessons that I hated. Stalls I didn’t particularly enjoy. Acrobatics made me sick. But when you have a goal, you can get a whole lot braver and work

a whole lot harder when you say, “I want to do that, so I’ve got to do this.”

KW: Speaking of goals, tell me about your transition from doctor and astronaut to writer.

RS: It was an incredible level of challenge. I didn’t write my book to become a writer – it’s not that I have taken on another career. I simply wanted to tell the story.

I had my book essentially handwritten on yellow legal pads – the chronology and major parts of the story – before I left NASA in 1996, so I could still go and ask the people I was working with, “Do I remember this right?” But in technical fields, you don’t put your feelings in there. You don’t put creative writing in there. You have to be very factual.

I was having a difficult time trying to figure out how to make it into a story that people wanted to read, rather than just a technical paper on my experience. So the yellow legal pads sat for years.

the same one –

RS: I had a wonderful mentor, David Pierce, who was kind enough to stick with me through the whole thing and very helpful in teaching me more about writing a good story and all of the techniques that writers use. I got the book into much better condition. As we went through the first iteration, David kept putting in the margin, “What were you thinking at this point? How did you feel?” I realized that people want to know, and that’s what makes a book lively, but I hadn’t quite learned how to do that. He would ask, “What’s the point of this story?” Many times I’ve gone back to the beginning and had to refresh it, and I’m still in the process of doing that.

KW: So what is the point of your story?

RS: I hesitate to say that this is a hero’s journey, but it kind of is. It’s being the first woman in a man’s world, and what it was like to want a woman’s life along with it – I wanted to marry and have a nice house and children – and try-

Things you do in your life can inspire other people to do the things they want to do. I think people ought to be given that as one of their assignments in life. Write something down.

After my second career at Vanderbilt, I had more free time, and I started thinking about it again. Of course one of the wonderful resources here in Murfreesboro is Middle Tennessee State University. Serendipitously, I came across the Writer’s Loft. I thought, *How perfect would that be?* Have certain assignments in writing, have a mentor to help me, but have very little class time.

KW: Students in the program can work with different mentors each semester, or stay with

ing to figure out how to be able to do all those things. When I reach 65 – which is rapidly approaching – if I ultimately had to choose between shuttle missions and children, would I have rather been among the first American women in space – possibly even the first – but never had any children, or would I have wanted to have had children but possibly missed any chance to fly in space?

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RIGHT Dr. Seddon conducts scientific research in space during her third flight, which was aboard the space shuttle *Columbia* – STS 58. (Photo courtesy of NASA).

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My husband [Robert L. “Hoot” Gibson] was also an astronaut. He’s a macho man, a man’s man, and that’s another part of the story. It’s also a circular story because after I went away and did all of those things, I came back to my hometown to raise my children and returned to the sort of the life I had started out to lead.

It’s a personal journey but in some ways typical of women my age.

KW: I’ve felt a kinship with you because of our mutual interest in math and science – but yours is an exceptional story for any generation. You’ve done what few have, regardless of gender.

RS: David Pierce reminded me of this: people want to come out of a book having learned something. I’ve done enough speaking that I know, from the questions I get, what people don’t know. People say, “Did you go to the moon in the space shuttle?” “What was the training like?” “Was it physically hard?” “Was it mentally hard?” “Did they try to weed people out?”

KW: And how did you get to be an astronaut? And before that, how does a girl growing up in the ‘50s and ‘60s come to decide, “I want to be a medical doctor?”

RS: Around 1960, *Life* magazine had a beautiful article about the discovery of the double helix of DNA and another theorizing the effects of weightlessness on humans. Those were hard reading for me in the seventh and eighth grades, but they caught my attention.

Luckily I had support from my parents, who told me, “You can do anything you want.” I had some practical advice from my father about how much money I would make, what kind of living I would have if I did this versus that.

I wanted to live an independent life. I wanted to have my own job and my own money and my own career. My mother was a wonderful person, but she was very dependent upon my father. There were things she would’ve liked to have done that my father didn’t want her to do, so she didn’t do them. I didn’t want to be that way.

I was fascinated by medicine, by physiology, by human, living creatures. I went to medical school because I could imagine myself doing that, day after day, taking care of ill people. But it was also the fact that it was fascinating, which I think is probably why I decided to apply to the space program. What a way to spend your days!

KW: I think your book is important not only for scientific and social history, but also for how

it relates to today’s context – how America is falling behind on math and science education and how fewer women are interested in some math and science fields.

RS: That’s one of the sidebars of my story, to inspire young women to go and do what they want to do, to encourage them to do some of the things that are hard.

KW: NASA recruited women for the shuttle program from the start. So on the one hand, they had to respect how much they had invested in you –

RS: Yes.

KW: But you gave birth three times while you were there. How did NASA react to your maternity?

RS: Shannon Lucid, who came into the program when I did, already had children. I was the first of us to get pregnant. Hoot and I didn’t tell anybody until I was well into the pregnancy. We went to Chris Kraft, the center director. He was wonderful, but when I got back to my office, the phone was ringing, and it was the flight surgeon, who said, “You’re grounded from T38 [jet trainer] flying.” That kind of broke my heart.

That was the only restriction they put on me, and I got some good job assignments in that time frame, but I sweated bullets about senior management – which was all male – and their opinion of pregnant women. I felt a lot of pressure to come back to work in six weeks. I came to the office before that, with the baby in the carrier.

With my second and third children I took three months off. It took a little courage to go to the boss and ask for that, but it worked out.

KW: It would seem to me, as a mom, that flying missions after the *Challenger* explosion would’ve been very hard. Yet I can also imagine that you could have felt more confident, as a scientist, post-*Challenger*. Did you have an increased sense, after *Challenger*, of knowing what the risks were?

RS: Yes – the reality. I think we all fooled ourselves because we had never lost any astronauts in space. The Apollo One fire happened on the launch pad. There were so many checks and balances on decisions and the machinery. After *Challenger*, seeing not only that astronauts lost their lives, but the devastation of families that were in the public eye – it was terrible.

A number of people left the astronaut program at that point in time. A lot of them not

because they were ready to leave but because their families didn’t want them to fly. Hoot and I didn’t really have that discussion, because we both knew we wanted to stay.

In a way the decision was easier for me because I had already been assigned to a second flight, one that was exactly what I came to NASA to do: life sciences research in space. I was very, very dedicated to that flight.

For my first flight, I was ready to die. If it happened, it happened. One of my philosophies in life is that you’ve got to be ready to meet your Maker, meaning: fill your life, do the important things (the book is certainly an important thing), try to do **today** what you want to do, because there may not be a tomorrow. So I was prepared in my own heart for that. But my husband flew the second flight after *Challenger*. I had a child who was six, and he was anxious about it, and I was six months pregnant. I wanted to be very positive, but at his launch, it was hard.

KW: I brought these copies of *Life* magazine from July and August, 1969. I’m sure you have better space souvenirs than this...

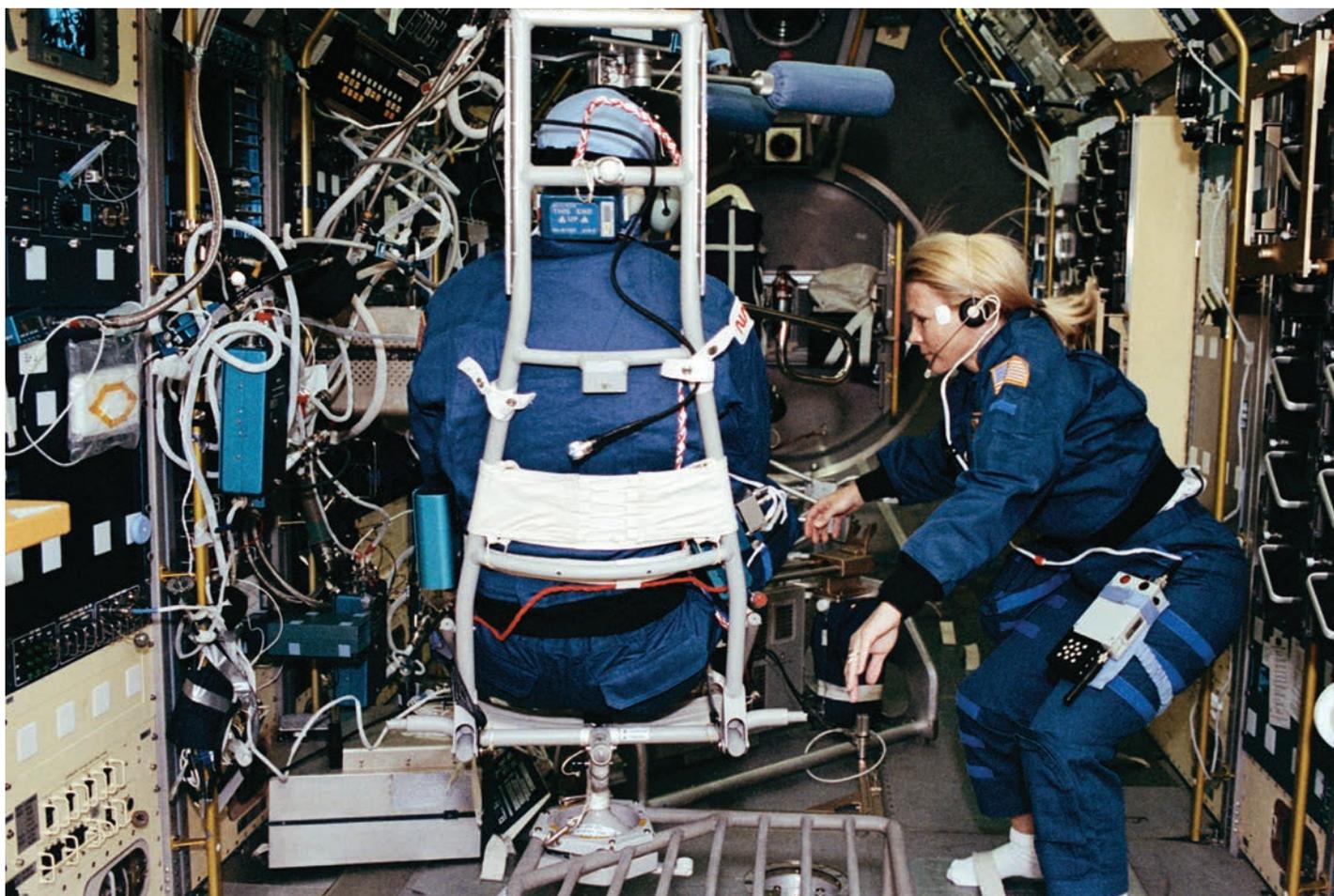
RS: Maybe not! Look at that!

KW: Spread after spread on the astronauts. Photos, in-depth interviews, even a poem by James Dickey imagining the walk on the moon. What excites us so much these days? What do you think about the status of U.S. space exploration and the end of the shuttle program?

RS: I’m not sure that anybody has been able to capture how we ought to set these audacious goals now. I think we were at a particular moment in time when the space program came along. We were worried that the Russians were going to put missiles in space – it was a Cold War, a scary thing – and I think JFK had his finger on the pulse of the people. He had strong leadership in the Congress, who also caught the vision. All of a sudden kids wanted to be engineers. Kids wanted to be astronauts. The country got behind it, universities got behind it, everybody jumped on board.

I’m kind of amazed that now the United States has said, “Space is a sideline over here. We’ll let business, the capitalist system, build rockets, and we won’t worry about it too much.” NASA’s still hanging on, but I think it looks for the next great challenge that people can get behind.

I used to say to kids, “If you’re the first person on Mars, send me a postcard.” There was a



definite date out there, and we were building the rockets that were going to get us there, and that looked like a feasible goal. You could see kids' eyes light up with that possibility. I can't really say that now.

Now it's "How do I be a rock star?" Not "How do I go to Mars?"

KW: You mentioned Kennedy's "audacious goal" for the country. Did you think of your career in terms of audacious goals?

RS: I don't think so. What I wanted to do was satisfy my own curiosity. When I applied to the space program, I had very little idea of what I would be doing. But the more I learned, the more people I met, the more I said, "I really want to do this." I was delighted they accepted me. But I never said, "I'm going to have this huge goal in mind."

KW: You've got this distance from your flights now... what's the big picture that you have as a result of looking out that window from the shuttle to Earth?

RS: From the shuttle, you can't see Earth the way the astronauts who went to the moon did. You can't see it as a big blue ball out in the

distance. You can see vast swaths of the earth, and you realize how connected we all are. You can see dust from Africa coming over and landing in Tennessee.

You can see smoke from fires in Central America wafting down. You can see the Amazon where they're cutting trees and all the mud is flowing into the river, and how it comes down and silts up on the coast.

You have this larger perspective of how we're connected, how the earth is this one thing we've all got. You don't see the little things that people are doing. You see the big things that are happening.

You're also aware of the fact that you can't see borders like a map, but you can see differences in how people live. For instance, if you take a picture from space of the border between the U.S. and Mexico, you can't see the people or buildings or anything like that, but you can see where the border is because north of the border are big fields. **Big** fields. Then there's a line, and below that are only little fields. The border between Egypt and Israel is similar because in Israel they irrigate. North of the

border, it's green and below is sand. It makes you ponder how we live differently in different places.

KW: You mentioned your yellow legal pads for the first draft of your book, but did you also keep a journal?

RS: In my heart I wanted to keep a journal, because I knew it was going to be a fabulous journey, one that women had not walked before. I wrote down a few things, but not much. I kept notes in the back of my schedule book, usually when I was mad about something (*laughter*), or something struck me about one of my kids.

I try to encourage people to write a book about their life – or ten pages about their life. I found a three page letter, typed, probably 1900, obviously dictated, by my great-great-grandfather. It documented what he did in the Civil War.

I would never have known anything about him other than his name had I not come across that. Things you do in your life can inspire other people to do the things they want to do. I think people ought to be given that as one of their assignments in life. Write something down.