

★  
**TO  
ZERO  
GRAVITY  
& BEYOND!**

**LEROY CHIAO'S TALES OF SPACE EXPLORATION**

---

INTERVIEW BY **JACOBA CHARLES**  
IMAGES COURTESY OF **DR. LEROY CHIAO**





Dr. Leroy Chiao was a NASA astronaut for 15 years, logging over 200 days in space (and 36 hours on spacewalks) before retiring to aid a private spaceflight company called Excalibur Almaz and raise his 14-month-old twins, Henry and Caroline. *Theme* interviewed Dr. Chiao from his home in Houston. Though he went into space on four mis-

sions, most of our conversation involved his life on the International Space Station, where he lived for six-and-a-half months with Russian astronaut Salizhan Sharipov, whom Chiao called “the brother I never had.”

**Theme:** Let’s start at the beginning. What does launch feel like?

Dr. Leroy Chiao: It depends—if you’re on a Russian Soyuz rocket, it’s so smooth you can’t actually feel liftoff. It feels quite different on the Space Shuttle—when those solid rockets light, it’s like someone kicked the back of your chair. You’re getting shaken around a lot and you feel the acceleration pushing you back in your seat as you take off. Then after the solid rocket boosters come off, it’s glass smooth. It’s not that uncomfortable, it just takes a little more effort to breathe. It’s like someone’s sitting on your chest.

**Can you see what’s happening?**

On my first flight, I had a mirror I could use to look out the overhead window. I could see the flames behind us, the ground rushing away, and ground starting to get dark; it was really pretty neat.

**Can you describe the first time you saw Earth from space?**

It was just amazing—there was a whole rush of emotions. The colors were so much more bright and vivid than I’d imagined. The one thing that really surprised me was that the sunlight coming through the atmosphere makes an incredible fluorescent blue line. It almost glows. It’s hard to capture on photos because the reflection of the sun on the clouds tends to wash it out. Seeing it with my own eyes for the first time was just surprising and exhilarating.

**What’s the strangest thing you’ve ever seen on Earth from outer space?**

The strangest thing was a huge golf course in Cambodia. There are also areas of very bright lights in the middle of nowhere. They’re probably security lights for some kind of military installation. And the Auroras (the northern lights) are very colorful and quite dramatic!

**Can you describe the living set-up inside the ISS?**

The livable part of the Space Station pretty much feels like a good-sized three-bedroom apartment, but in a series of tubes. It’s plenty of room for two people. I had an office area with family photos on the wall, a computer, and a shelf where I kept my notebook and pencil—tethered, so it wouldn’t float away!

**What does it feel like to always be floating?**

Actually floating is a very pleasant feeling. You feel very free. But it can be a nuisance because you always need to steady yourself or you just float away! You can’t sit in a chair, and you can’t just stand somewhere. So what you do is hold onto a railing, if whatever you have to do is one-handed, but more often you hook your feet under a rail to anchor yourself. We developed calluses on the top of our feet from hooking them under the handrails all the time.

In space there is no up or down, no floor or ceiling, so there are things happening on all the sides. All the walls are set up

with handrails and you just decide to make that surface the floor.

**Is Zero-G good or bad for your body?**

If you were in space and just floated around without exercising, it would be the same as lying in bed all day. Even though you’re moving around a lot, all you have to use are your fingertips to push off of things. You certainly don’t walk, and your heart and your lungs don’t really have to work. So we spend about two hours a day exercising on the Space Station, both cardio and resistance exercises.

**Does it ever feel cramped or claustrophobic?**

Astronauts can’t get claustrophobia. They test for that during the interview: they zip you up in a large duffle bag and they have you wired up with an EKG to watch your heart and everything. I think they just want to see if you’re going to freak out. I actually fell asleep during that test. It was nice and quiet and dark...once that happens, they let you out.

**What’s it like to do a spacewalk?**

The first time I went out the hatch and got a helmet-ful of the view, everything looked so different. The Earth really looks like a ball once you get out and see it without a window or a frame or anything—it’s just this whole, big marble. It’s kind of surprising that it looked so different from what it looks like through the window. I guess it’s like on Earth, if you’re driving a car and



**“When you let fluid out of a drink bag it forms a ball and floats around and you can move it by blowing on it or moving it with a straw.”**



you see a fantastic mountain or sunset it’s just so much better if you stop the car and get out.

Also, during a spacewalk you can convince yourself that if you let go you’re going to fall to the Earth. On one of my spacewalks I was at the very end of the Space Station, with the Earth down there “below” me. It kind of felt like I was hanging off the edge of a balcony. It was kind of fun actually; you get that feeling in your stomach like “Hey I’m going to fall!”

The reverse happens too: When you come back from space you’re used to being able to let go of things in mid-air and not have anything happen. More than one astronaut has dropped things, pens or a cup, when he got back to Earth.

**What do you do in your free time on the Space Station?**

Look at the photos I shot that day, catch up on email, or look out the window some more.

**Wait—you can actually get email in space?**

It’s not real-time; Mission Control will sync your inbox about every eight hours. It’s not real-time communication, but it’s not bad. And people love getting emails from space.

**What sort of things seem normal up there that would be totally surreal to most of us?**

We all play with our water or some kind of drink. When you let fluid out of a drink bag it forms a ball and floats around and you can move it by blowing on it or moving it with a straw or something.



### Can you eat noodles in space?

We do eat noodles, actually. You wouldn't have a big bowl of noodle soup, but we do have soup bags. Drink containers are all one soft plastic container; you cut off the end and unroll this long tube, like a straw but it's all one piece, and squeeze the soup or water or whatever out into your mouth. So if you had noodle soup, you could suck the noodles through. If you had noodles in a thick sauce, you could cut the container open and eat it with chopsticks. In fact, I had chopsticks on the spaceship.

### What food do you want most in outer space that you can't have?

One of the things we miss when we're in space is crispy food, like chips and crackers. But you can't eat those because the crumbs would float all over the place.

Fresh fruits and vegetables are also things we look forward to when the resupply ship comes. We must eat them quickly, before they spoil. It was always a nice treat to eat raw onions or garlic when the resupply ships come every three months, to add a little flavor to your food.

Is there any food that's better in outer space than it is on Earth? When camping, for example, we think salami is delicious, but back home we don't care for it much.

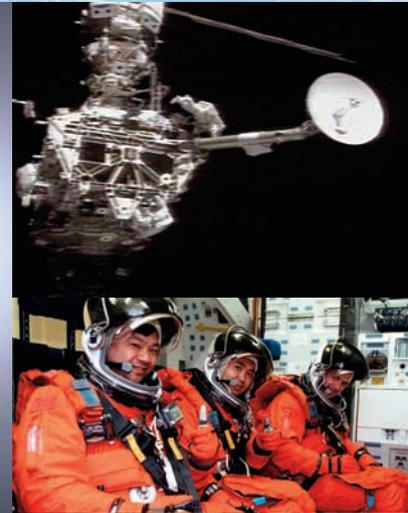
All space food is that way! Exactly, just like camping. It all seems delicious after a few weeks, but you wouldn't choose it on Earth.

### What do you wear when you're up there?

We wear pretty much normal clothes—cotton T-shirts and pants made out of Nomex fiber, because it's fire retardant, like military flight suits.

### How do you do laundry?

You don't. It's basically camping: you might wear a T-shirt for a few days, then that becomes your workout shirt, and then





**Views of Earth Clockwise:**

Bahamas  
Boston  
Ching Hai Hu, China  
Egypt  
Cape Cod  
Nepal  
Florida, South Tip  
New York City

**“The one thing that really surprised me was that the sunlight coming through the atmosphere makes an incredible fluorescent blue line. It almost glows. It’s hard to capture on photos because the reflection of the sun on the clouds tends to wash it out. Seeing it with my own eyes for the first time was just surprising and exhilarating.”**

you throw it away. When the resupply ship comes you unload everything and then you put all the trash on it. Because it doesn’t have a heat shield, everything burns up when it re-enters the atmosphere.

It’s kind of funny because Salizhan is a Russian Air Force Colonel but ethnically he’s an Uzbek, so we were the first all-Asian crew on the station. People ask how we could stand each other, but we just don’t have as much body odor...we could wear our clothes longer.

**What are some of the other environmental hardships that come with being in space?**

The environment is very dry, so your lips get chapped and your skin gets dry; we keep humidity levels low to keep mold or fungus from growing. Your fingertips are also taking a beating because you have to use them to move everywhere that you’re going to go, by pushing off. You can get some big painful cracks and splits on your fingertips if you don’t take good care of them.

**Do you have any privacy?**

On the Space Station we have sleep stations about the size of a phone booth. You zip yourself into your sleeping bag, close the door, and then you just kind of float around in there. The weird thing was, for the first few nights you didn’t know what to do with your head because you’re used to having it on a pillow. But it’s a very comfortable way to sleep once you get used to it. There are no sore spots and your arm never goes numb because you were laying on it.

**What are some other unexpected hassles about living in space?**

It can be frustrating to lose things in space. It’s easy to do in zero gravity! Things just float away. Everything has to have a little piece of Velcro on it, or you slip it under a

plastic bungee. But if someone [floats] by and bumps into it, it can disappear. Not just small things but fairly large things as well. You might not find them for days or months, and some things you never find!

Also, everything you do has to be so well-thought-out. How do you cut your nails without all these fingernails flying around the station? I’d get a loop of duct tape and stick it on the wall and get down near the filters, then try to catch each nail and stick it on the tape. If I missed, it would probably get pulled into the filters. These are all things that you’ve got to think about!

**How do you bathe?**

We stay very clean because we use the same products that they use in hospitals for patients who’re too sick to get out of bed, rinseless shampoos and body washes. You take some water from the drink bag and towel it into your hair and then towel it out again, but it’s not nearly as satisfying as a hot shower.

**I don’t know if I want to ask this, but how do you go to the bathroom?**

You have a space toilet. It uses fans to pull everything down to where it’s supposed to go—it’s something you have to train on and be very careful about how you use. One of our rules is, you clean up your own mess.

**What do you feel that commercial space-flight would contribute to society?**

It would give people perspective on the Earth and hopefully make them more respectful of the Earth and tolerant of others. Also, by driving technology and operations, there will be spinoff improvements to better life on Earth. z