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## Back from space, astronaut reflects on faith, planet

by Jeannette Cooperman



She first explored the bottom of the ocean as a diving and salvage

officer, learned surface warfare, did underwater ship husbandry. Then she heard NASA was trying to build a space station in orbit, and she thought, "If I can build a ship underwater, I think I could build a space station, so I probably have something to offer."

Heidemarie Stefanyshyn-Piper, a 45-year-old U.S. Navy captain and NASA mission specialist, returned from two weeks at the International Space Station in November. In 2006, she was part of the Atlantis team that restarted the station's assembly; on this flight, she helped expand the station's living quarters. By the time she returned, she'd orbited the Earth 250 times, logging more than 6 million miles.

**Cooperman: You've spent time underwater and in space, and neither is exactly congenial to human life ?**

Yeah, but humans, clever beings that we are, have been able to figure out how to get there. And the two are quite similar: In each case, you have to have your own life-support system, so you're in some sort of suit. In the water, though, parts of you are in contact with the water around you; in space, you're in a completely self-contained suit, and there's nothing outside.



### **What's the biggest difference?**

Moving around. We train underwater, and some things are easier in the water and some are a lot harder. In space, it's really easy to start moving, but it takes a lot of finesse to stop yourself and to keep yourself where you want to be.

### **Are you amazed at how far we've come or surprised we're not already on Mars?**

The fact that we've had people living on a space station for eight years is pretty amazing. It takes an exponential amount of effort and increase in technology to go to the next level. And people don't realize how far away Mars really is. Maybe we've just been watching too many Hollywood movies.

### **What accomplishments thrill you?**

One of the systems our shuttle flight brought up to the space station is a system that processes urine and turns it into potable water. We are able to reclaim about 90 percent of the water, and it can be separated for oxygen. That's important, because when we do go to Mars, we just can't take the amount of oxygen we need with us.

### **You went to Catholic schools for 12 years and remain Catholic. What's been your most spiritual experience in space?**

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Going out on the space walks ? I've been on three now ? you look down on one side and see the Earth go by, and it's spectacular. You look at the horizon, and you see the blue atmosphere, and it's very, very thin; then it fades away, and beyond that is just black space. You realize that thin covering is what sustains life on Earth. It's just amazing that it exists.

### **So science doesn't conflict with your faith?**

The core of what I believe is that we are put here on Earth by God, and as much as we learn about the universe ? evolution, all the theories they've come up with ? yeah, it all explains how everything came to be, but when you go back, you still ask yourself, ?Well, what started the whole thing? What created the Big Bang?? A higher being. We are learning more and more about the universe from satellites and telescopes, but none of that negates the fact that there is a God.

**Are you a control freak or not? Because you keep putting yourself in situations where you're completely vulnerable, yet you have to monitor every single variable.**

You do give up a lot of control, because you can't do this by yourself. Everybody does their little part; you're a team. People in the space business take their job very seriously. And, yes, you do have to pay attention. Going out on a space walk ? even though I had practiced it in the pool ? is new, and you have to be extremely vigilant. You are putting yourself in a hostile environment, and mistakes cannot be tolerated.



**Er ? speaking of mistakes ? after your \$100,000 tool bag floated free into space, you took a lot of ribbing. Sick of the subject?**

Yeah. I'm a little amazed at all the interest. You wouldn't believe the number of stories I've heard from people who say they have had similar experiences ?

?Oh yeah, I was on the roof of my house and I dropped a tool bag.? Not quite the same. All you have to do is climb down the ladder and retrieve it.

**You can see the tool bag floating in space, right?**

Yeah, for amateur astronomers, it's something new they can track.

**Do you mind the whole world watching your every move?**

It's part of the territory. Everything you do in space is recorded, and sometimes that's difficult, especially when things don't go right. But it's a way for folks on the ground to be part of it. So if that is the price we have to pay then so be it.

**I hear you brought spiders with you?**

We took up a habitat, to understand how a spider would react to being weightless. Actually there were two spiders, a primary and a backup, and some fruit flies for them to eat. We watched the spiders build webs ? there was a camera in the habitat ? and some of the webs appeared symmetrical, and others did not.

**So I guess the web's the only way to tell how they were reacting?**

Yeah, I couldn't see if he was smiling or not.

**How does traveling to space change you?**

I think you come back with a better appreciation of life on Earth ? just taking care of our planet. You start

to be a little more green, because up in space, you only have what you have. Here on Earth, we are in kind of the same situation ? we only have what we have ? but we have so much that people don't realize the resources are limited.

### **Any shift in perspective?**

When you look at the Earth as a whole, it's one big planet; you don't see divisions between countries. And it's an international space station; we are living and working with partners who are Russian, European, Canadian, Japanese. So when you come back, you put a lot of those differences aside. You get more tolerant.

### **Does your husband fret about you?**

Yes. He's an engineer with the space program, too, so he understands, but when I come back, he makes sure I listen to what the doctors and athletic trainers tell me I can and cannot do. Two weeks is about when your body starts to need time to recuperate; it's like being in bed for two weeks. I was wanting to go jogging, and he said, "We'll walk."

### **You're a middle-aged mom and you've done everything from deep-sea salvage to space walking. What drives you?**

Adventure's part of it. It's always exciting to do something different. And I grew up with four brothers. My parents both came over from Europe. My dad's Ukrainian, and my mom was the only one in her family to move here from Germany after high school. They were big proponents of education; that's why they sent all five of us to Catholic schools. They always said, "Hey, do better."

### **What's hardest about space travel?**

Coming back. Getting used to gravity again. It's part of the Earth; it's how everything stays here. When you don't feel the effects of it, everything floats, and it's pleasant; it can be fun. I'm not a gymnast, but I can do flips in orbit, and I can carry something that weighs 1,000 pounds. And then you readjust, and your body and brain figure out, "OK, now I'm back here, and life goes on."

### **How do you manage to shuttle, if you'll forgive the pun, between tiny details and the vastness of space?**

You focus on your task at hand: I'm installing this bearing that holds the solar alpha rotary joint onto the rest of the truss, for example, and you lift your head up and see the Earth going by. You just ? move between the extremes.

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