



# UH Alumnus Makes First Trip to Space

By Brian Allen

At T-minus six seconds, the main engines ignite. At T-minus zero, the solid rocket boosters light, the Shuttle begins to shake, and the ride of a lifetime begins.

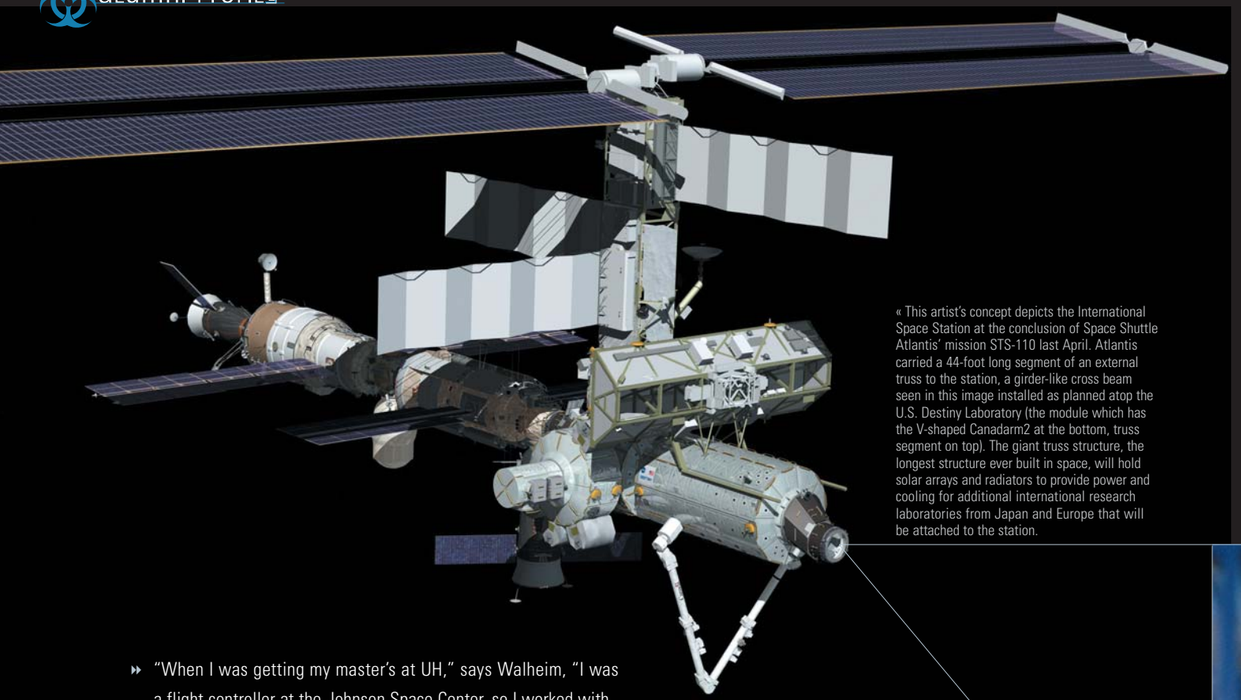
Astronaut Rex J. Walheim (1989 MSIE) has felt these sensations before—the G-forces and the shaking—but that was in the simulators. This time it's real, and the 39-year-old Air Force lieutenant colonel knows his dream of space flight is finally becoming a reality.

Walheim, who characterizes himself as a "window-seat" kind of guy, was determined to enjoy the spectacle of space travel—including the liftoff, which is normally difficult to view, even from the flight deck.

"I had a little wrist mirror that I had on my left arm so I could look out the overhead window behind us, and when the main engines came up I could see the smoke from the exhaust coming up," says Walheim. "A little later I looked up again and I could see the beach out the back window, and I could see it just fading away. It was just really amazing to see how fast we were climbing. You're going about 100 mph by the time you clear the pad so it doesn't take long. You're really screamin'."

Walheim, a native of San Carlos, Calif., made his first trip to space last April, completing two successful spacewalks during NASA's Atlantis STS-110 mission to the International Space Station. But he might never have made it to space, were it not for his decision in the mid eighties to pursue a master's degree at the UH Cullen College of Engineering.

PHOTO BY MARK LACY



« This artist's concept depicts the International Space Station at the conclusion of Space Shuttle Atlantis' mission STS-110 last April. Atlantis carried a 44-foot long segment of an external truss to the station, a girder-like cross beam seen in this image installed as planned atop the U.S. Destiny Laboratory (the module which has the V-shaped Canadarm2 at the bottom, truss segment on top). The giant truss structure, the longest structure ever built in space, will hold solar arrays and radiators to provide power and cooling for additional international research laboratories from Japan and Europe that will be attached to the station.

» "When I was getting my master's at UH," says Walheim, "I was a flight controller at the Johnson Space Center, so I worked with astronauts and knew what they were looking for in backgrounds."

He knew he needed an advanced technical degree, and he knew he needed flight experience if he was ever going to realize his dream of becoming an astronaut.

"I was working here as a lieutenant in the Air Force as a flight controller for the shuttle program when a friend of mine told me about this master's program that he was starting in industrial engineering," says Walheim, who received his bachelor's degree from the University of California at Berkeley. "It seemed to me it would open some doors for me in the future, so I decided before I committed to it I'd try a class. I tried it, and I enjoyed the class, so I kept with it and decided to go through the whole program and get the degree."

Walheim's experience at UH will sound familiar to many graduates of the urban research university. He worked all day and attended classes at night to boost his career into a whole new orbit.

"I had to go to class after work and study after work so it was difficult for a while," says Walheim. "One nice thing that the Air Force did is they allowed me to go to school full-time for six months, so I was able to finish the last portion of the degree program full-time. But for the first year and a half, I was doing it after work. That was considerably more difficult, but it was still rewarding, especially when I finished up."

After completing his master's degree in Industrial Engineering at the Cullen College of Engineering, Walheim, already a captain in the United States Air Force, was one pivotal step closer to becoming an astronaut. Once he was accepted to test pilot school, he gained the necessary flight experience, and he was ready for astronaut training.

"Before I left here in 1989, I hadn't flown for the Air Force before," says Walheim, who knew as a child that he wanted to fly someday. "As a kid it was something I enjoyed reading about and thinking about. To a certain extent, I always wanted to be a pilot and ended up being an engineer through a roundabout set of circumstances."

That engineering education came in handy during Walheim's first-ever spacewalk, when he had to solve some unexpected mechanical problems on the fly.

The primary mission was to deliver and install the first segment of an external truss structure that will support additional power and cooling systems for future international laboratories. Both problems arose in the installation of the segment. »





## Searching the Stars

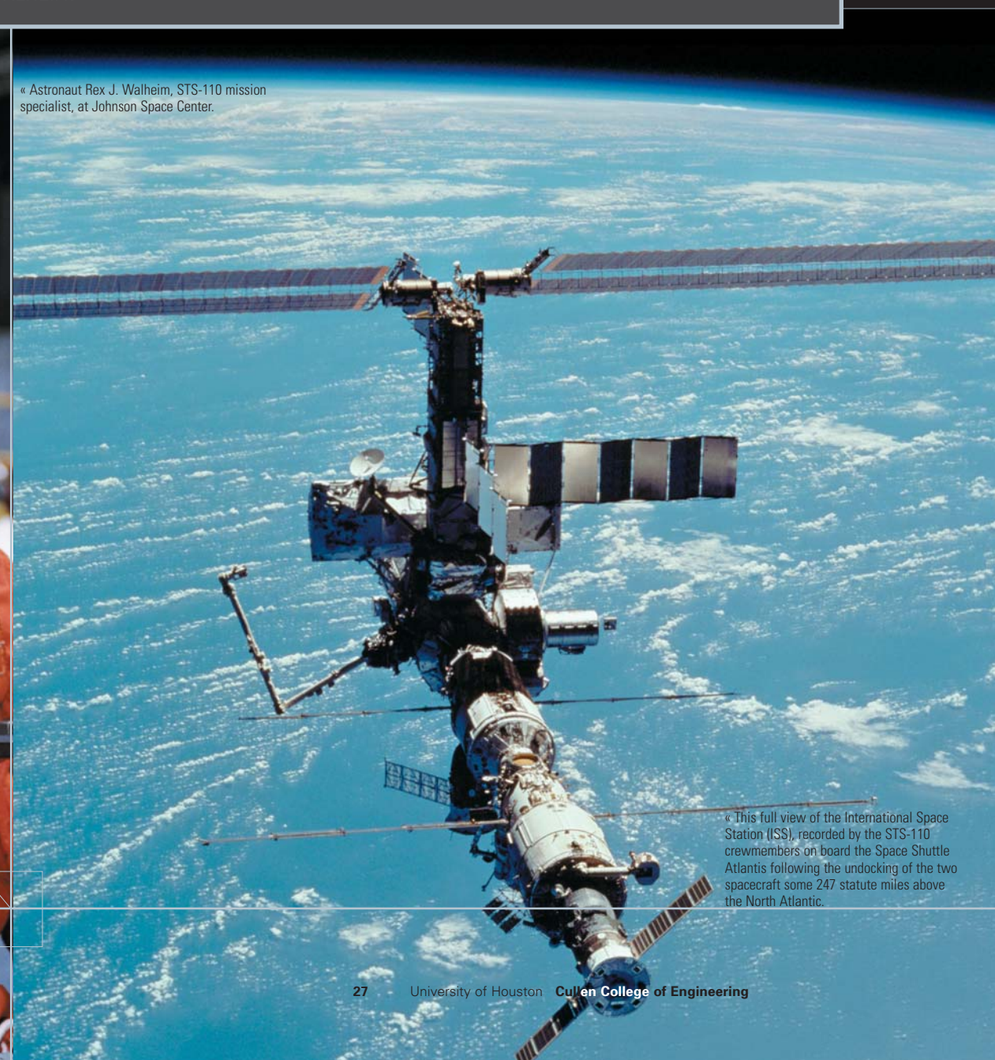
It's just past sunset when a woman and her two young sons head out to the front yard and search the evening sky for two bright lights.

Alex and Jeffrey, ages four and five, are joining their mother, Margie, as they look for their father's spaceship, the Space Shuttle Atlantis, and the International Space Station. Both should be made visible by sunlight while the sky is still dark.

"My wife and boys had a chance—just after we undocked from the space station—and they could see both the shuttle and the space station fly over," says astronaut **Rex Walheim**.

The ground tracks for every shuttle mission and the space station are available on the Web (http://liftoff.msfc.nasa.gov/temp/StationLoc.html), and under fair weather conditions both are clearly visible when the flight path takes them overhead. As more segments are added to the station in the coming months, it should become larger and easier to see, says Walheim.

« Astronaut Rex J. Walheim, STS-110 mission specialist, at Johnson Space Center.



« This full view of the International Space Station (ISS), recorded by the STS-110 crewmembers on board the Space Shuttle Atlantis following the undocking of the two spacecraft some 247 statute miles above the North Atlantic.

First, Walheim and fellow spacewalker Steve Smith had trouble with the bolts that attach the truss segment to the top of the lab. "We had an electric drill, a power tool that we bring out with us, and it wouldn't release these bolts originally and it was a little bit tighter than we thought so we went to a manual ratchet mode and were able to manually break the bolts free to some higher settings and then we were able to release them."

The pair then dealt successfully with another jammed object, a tray-like attachment to the truss. "We also had a problem with a tray that swings down from the s zero truss," says Walheim, "and it was supposed to swing down fairly easily. My partner was supposed to be able to do it by himself, and he couldn't get it all the way down so I went back there and helped him pull it down and latch it into place. But we got that deployed and we were able to continue with the work that we were supposed to do. So there were a few contingencies that we had to deal with but it worked out okay."

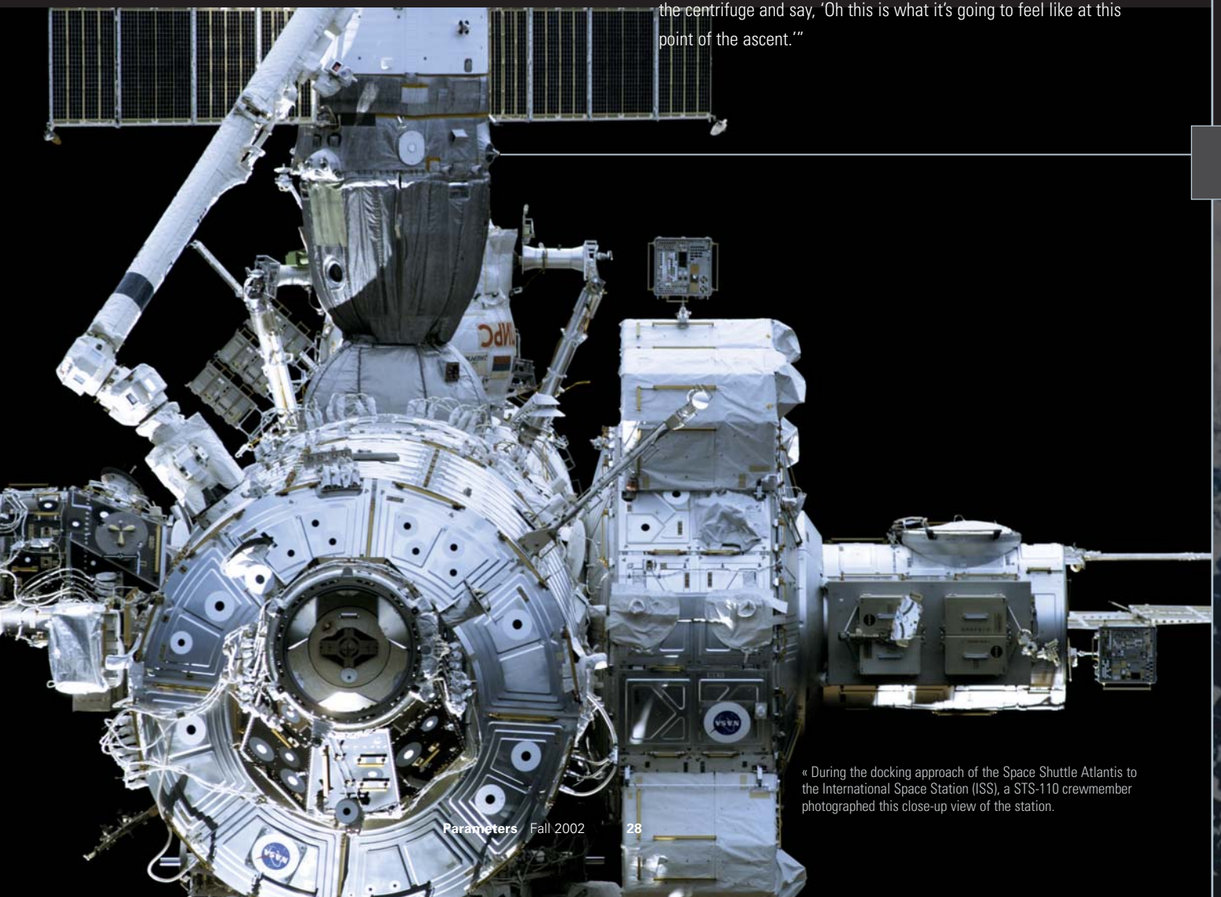
The key to being able to handle the unexpected glitches of a mission is in the training and preparation, Walheim says.

"The training was really good," he says. "I was really pleased with the mock-ups we have in the pool. It really makes you feel comfortable because you get out on the space station and it feels like you've been there before. You're familiar with almost a muscle memory of where hand-holds are and how the task should feel and the position you should be in."

The training in the pool had its limitations too. "With the water you have some viscosity effects which slow you down and make it easier to stay in one place, but out in space you don't have that so it's easier to start moving but it's a little bit harder to stop moving because you don't have the water slowing you down."

Walheim says the simulator can simulate the shaking but in order to simulate the G-forces, the astronauts traveled to San Antonio, where they had access to a centrifuge.

"They spin us around to the G-profile of an ascent, and that was very useful because when you are sitting here in the regular simulator you just don't feel how it's going to feel when you have three G's pushing on your chest. It was really kind of an eye opener to go into the centrifuge and say, 'Oh this is what it's going to feel like at this point of the ascent.'"



« During the docking approach of the Space Shuttle Atlantis to the International Space Station (ISS), a STS-110 crewmember photographed this close-up view of the station.





The mission itself provided Walheim with plenty of opportunities to put his training and education to use, but it also provided him with many memorable "window-seat" moments.

"We were fortunate to have a lot of good day passes over the United States, which included several passes over California, which is my home state," Walheim says, "and we flew over Texas a couple of times too. When we flew over Southern California, I could gauge our speed and distance by watching these two lakebeds that are very large and easy to spot. I would continue to watch them as they receded into the distance. I could see them all the way past Salt Lake City into Wyoming on the horizon. So you could see over a thousand miles in any direction. It was really spectacular."

Walheim was also particularly excited about the opportunity to work on the space station, which he believes is the future of our space program.

"The Hubble Space Telescope has made great contributions to the understanding of the universe," Walheim says. "We can build on that and do a much wider variety of research on the International Space Station. We can do Earth observations and observations of the universe, but you're also doing medical science, research on new types of drugs, on combustion science, on the effects of long-duration space flight on humans. We're trying to prepare ourselves for going farther—maybe going back to the moon or to Mars—and the way we're going to do that is through space station research. I think the more people learn about it and see it as it gets bigger and bigger, they will get more excited about it."

Now that the mission is over, what's next for the spacewalking UH graduate?

"I'll get another technical job. I've been here for six years now and up until I got assigned to the flight last year I had various technical jobs. So I'll go back to having a new job, maybe in the spacewalk area, the area that helps plan and prepare for spacewalks in the future and helps out with some of the groundwork for the people who will be doing spacewalks."

Walheim is aware that many people perceive astronauts as heroes. Does he ever think of himself as a hero?

"You don't feel like one. You just do your job the best you can, but you are aware of the fact that what you do has the chance to inspire kids and students of tomorrow to try and realize their dreams. That's the main message we try to get across to them: Try to follow your dreams because—as we can show—they really do come true."

PHOTOS COURTESY OF NASA JOHNSON SPACE CENTER

## Cougars In Space

### CURRENT ASTRONAUTS:

Bonnie Dunbar (1983 PhD BioE)
Mike Fossum (1997 MS, UHCL)
Richard Mastracchio (1991 MS, UHCL)
John Olivas (1993 MSME)
Rex Walheim (1989 MSIE)

### FORMER ASTRONAUTS:

Guion Bluford (1987 MBA, UHCL)
Maurizio Cheli (1994 MS AeroE)
Nancy Currie (1997 PhD IE)
Greg Harbaugh (1986 MS, UHCL)
Bernard Harris (1978 BS)
Donald Holmquest (1980 JD)
Bruce McCandless (1987 MBA, UHCL)
Story Musgrave (1987 MA, UHCL)

Astronaut information is available at http://www.jsc.nasa.gov/Bios/astrobio.html