A Focused Force for Faith

By Tani Trost

When Leslie Wickman focuses her time and energy, amazing things happen. The 900-foot-long fountain at the Bellagio resort in Las Vegas shoots water 250 feet straight up in the air. A university science center helps students, faculty, and the community understand how science and the Christian faith fit together. And, American astronauts will wear better spacesuits.

Thriving on adventure, Dr. Wickman's exploits take her places most people don't even dream about—bungee jumping off a bridge in New Zealand, kayaking the waters of Alaska, and lecturing at the International Space University in France. Her love for discovering the unknown has taken Wickman not only around the world, but also above the world. Strong, intelligent, and resilient, Wickman became one of the first women astronauts-in-training while working at Lockheed Martin in Northern California. With a twinkle in her eyes, she relates stories of reduced gravity—even weightlessness—in the KC-135 research aircraft (see sidebar).

An interest in international relations and arms control negotiations earned Wickman a bachelor's degree in political science at Willamette University in Salem, Oregon. Her passion for science soon propelled Wickman on to Stanford where she earned a master's degree in aero/astro engineering and a doctorate in human factors and biomechanics.

FACTS *for* FAITH

I understand you were raised in Oregon and Washington. Did you grow up in a city or in a rural area?

LESLIE WICKMAN

We lived in a very rural area about sixty twisting two-lane miles away from the nearest doctor, hospital, or movie theatre. School was seven miles away. In fact, my grade school class only had about seventeen kids in it. My family lived right on the beach, so we'd hear the waves at night while going to sleep. In the daytime we played on the beach and made forts in the forest on the other side of our house. My dad also kept a telescope, so my family used to look at the stars and the planets. That probably sparked my early interest in astronomy and space.

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Did you have a sense back then that someone must have created the universe—making all this beauty and wonder?

LW

Because I was raised in a Christian home, we all had an underlying faith in God as the Creator of everything. My dad, an engineer, was very analytical. He had a strong interest in math and science and certainly encouraged that interest in my brothers and me. And when we looked at the stars and the planets it was always with the understanding that God was their Creator.

However, I was taught something quite different in the public schools. I was forced to learn what the teachers taught about naturalistic processes so that I could pass the tests. All the while, I still believed that God was the Creator—yet I didn't really know how to integrate the two. How could the theories of origins being taught integrate with my belief in God? So in a sense I compartmentalized my faith and my belief in God as the Creator apart from theories that I didn't know what to make of. Not until much later in life did I see how my faith and science could fit together.

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How did you discover that science and faith <u>do</u> fit together?

LW

Several years ago someone handed me Hugh Ross's book, *The Fingerprint of God.* It was like taking a deep breath of fresh air. I could finally see a way to look at what we're

learning about the universe through science that doesn't contradict Scripture.

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Is that when you first heard about Reasons To Believe?

L W
I think I first learned of Reasons To Believe at a science and theology conference held by my predecessor at the Center for Research in Science—CRIS—at Azusa Pacific University. Dr. Ross spoke at that conference a couple of years ago.

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Tell us about CRIS.

L W
CRIS is a community of scholars that emerged in the fall of 1998 as an academic unit of the College of Liberal Arts and Sciences at Azusa Pacific University (APU). CRIS has a three-fold mission. One purpose is to strengthen the science education experience for students at APU. Another is to bring new scientific research programs onto campus for both the students and faculty. And the third is to stimulate dialogue connecting science and theology—to get people thinking about the questions of how science can be integrated with their personal faith.

"As educators break down the perceived barriers between science and theology, more students will realize they can hold a consistent, integrated worldview if they work in the sciences."

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How much have the students responded?

L W
Student involvement seems to be growing. We've had a number of science-and-theology discussion groups on campus, and attendance has varied depending on the topic and how well it got publicized. But in general, I think there's an upward trend. At the start of each semester I talk about CRIS and its mission to the classes I teach. This effort has brought us at least one student intern. And I've had different people volunteer or seek employment at the center because of their interest in what we're doing.

Faculty members promote the different activities in class and encourage students to come. Sometimes we offer extra credit. CRIS also maintains a Web site [www.apu.edu/cris] and office space on the campus where students can volunteer to work.

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Are your lectures open to the public?

L W
CRIS offers science-and-theology discussion groups or seminars almost every month. We open these free monthly seminars to the public. Most of the faculty, at least in the sciences, are aware of CRIS, and we've got a growing profile. When Dr. Fazale Rana came from Reasons To Believe to lecture on "Ethics in Biotechnology," we had a good turnout, and a number of interested people from the community attended.

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How can organizations like CRIS and Reasons To Believe help motivate young people to become astronomers and physicists?

L W
As educators break down the perceived barriers between science and theology, more students will realize they can hold a consistent, integrated worldview if they work in the sciences. I think many of them have felt, like I did, that they had to compartmentalize what they learned through science, keeping it apart from their faith. That kind of separation makes a person feel a little schizoid. If you can't have an integrated worldview or a cohesive thought process, being dedicated is hard. A passionate pursuit of science would be difficult if you perceived that pursuit as conflicting with your core beliefs.

Educators can help people understand that learning more about nature through science can inform our faith. And, the more we learn the truth about God, the more our science can be informed. Those two avenues work together to give a full understanding of the bigger picture of truth. Truth can't contradict truth. The more young people can be shown how those two avenues help provide a fuller picture of truth, the more they will feel free to pursue science with wholeheartedness.

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Believing as passionately as you do, what do you personally hope to accomplish as director of CRIS?

L W
CRIS has a grassroots level of influence with the students. I'd like to see them gain a basic understanding of how science supports their faith. And, at APU in particular, we develop many future schoolteachers. I'd love to see a class on campus designed to help these students learn how to present science in such a way that, at the very least, it doesn't conflict with a person's faith in God. At the best, the students would learn to teach how science *supports* a person's faith. Obviously, different approaches must be taken for students going on to teach at public schools rather than Christian schools. I would love to see coursework developed in that area. ▸▸▸

The Vomit Comet

The Apollo 13 movie showed a weightless Tom Hanks floating about on the spacecraft. Dr. Wickman trained on the same plane that was used in the film and shared her astronaut training experience with FACTS for FAITH.

Weightless training in the KC-135.

L W
While at Lockheed Martin I participated in reduced-gravity simulations both for weightlessness and for partial gravity on the KC-135 research aircraft, affectionately termed "The Vomit Comet." There's a good reason it's called that—because at least the first time most people go on it, they get motion sickness. The aircraft basically flies a series of parabolic trajectories—which means you're flying along straight and level and then the aircraft does a radical climb, pulling about 2 G's as it enters the beginning of the parabola. Then as the plane goes over the top of the parabola, where the centrifugal force away from the center of the arc offsets gravity, you become essentially weightless for about 20 seconds inside the plane. The plane pulls another 2 G's coming out of the parabola, and goes straight and level for a few seconds until the next one starts. So you're going through this series of parabolas, changing G-levels all the time, for 10 or 15 in a row. Then the pilots turn around and do another 10 or 15. A whole flight consists of anywhere from about 25-40 parabolas.

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Wow, that sounds like a space roller coaster! What actually triggers the nausea?

L W
During the exercise you're inside the fuselage of the plane—up in the clouds essentially—so you have no visual reference at all as to what the plane's doing. All you see is the inside of the fuselage, while your body experiences these changing G-levels. Motion sickness occurs when you have a conflict between the different physiological cues that your body gives. The problem might be differences between visual and inner ear cues, like when a person gets carsick, or confusion with the sensors in your muscles that tell the brain where your body limbs are located and how much force they are encountering. If the various cues you sense from your external world are in conflict with your internal references, your body perceives a problem. You throw up because your brain deduces from these conflicting cues that you must have been poisoned. So your body reacts by trying to get rid of the poison.

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Did you get sick?

L W
When I went on it the first time, I didn't think I'd get sick because I'm used to doing all kinds of crazy things, like skydiving, parachuting, surfing, riding roller coasters, and so on. The instructors told me when I first got on that I should just sit still for the first few parabolas and get adapted. So I sat through the first one in the back of the plane and thought, "Okay, I'm going to be fine." Then I got up and started doing somersaults and playing games during the weightless periods.

After about 12 parabolas I started feeling kind of queasy and decided I'd better go to the back of the plane and sit down. Before taking off they always stuff all the pockets of your flight suit full of plastic "barf bags." A few parabolas later I desperately needed those bags. And the pilots don't turn around and go home just because they've got a sick person in the back. They keep going through the parabolas. Once you've gotten sick it starts to become like Pavlov's experiment with the dog. They turn on these bright photographic lights for the video data tapes right before you're going into the weightless part of the parabola. About once every 30 seconds the lights come on and you think, "Oh great! Here we go again."

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Did these tests dampen your desire to be an astronaut?

L W
Nothing about training dissuaded me from wanting to fly in space. Besides, no direct correlation has been found between the people who get sick on the KC-135 and the people who get sick in space. With the KC-135 you're constantly cycling between different gravity levels, whereas in space you're basically in microgravity the whole time, aside from the launch and re-entry. I think probably the least attractive aspect of being in space is the confinement to a small pressurized vehicle for a long period of time. I was involved in extravehicular activity, which meant putting a spacesuit on

Leslie performing underwater neutral buoyancy simulations.

Photography courtesy Leslie Williams

Outside the classroom, Leslie enjoys exploring the multifaceted aspects of God's creation.

and working outside the vehicle. But going outside in space is a lot different from going outside on Earth.

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Did you consider training for a long trip?

L W
For me, a short mission would be a lot more appealing than a long one. A Mars mission isn't as inviting to me as something closer to home, like going to the Moon or to a space station. Right now, the shortest possible trip to Mars and back is about 27 months. And that's just travel time. Once there, and having gone all that way, you'd need to spend a significant amount of time on the surface of the planet to make the trip worthwhile. The shortest round-trip mission that anybody's considering would take about three years. That's a long time not to be able to go outside and play!

CAREER HIGHLIGHTS

- Twelve years at Lockheed Martin in California, working on various NASA projects, the Hubble Space Telescope program, and the International Space Station; researched space suit design with NASA for planetary exploration; received astronaut training to support different tests, data acquisition, and development of hardware in order to design spacecraft, tools, and interfaces for astronauts working in space; underwent scuba training to support the neutral buoyancy simulations of the various activities done in space by astronauts, such as interacting with the telescope or space station; logged over 100 hours of time in the shuttle spacesuit working under water; received further astronaut training as a potential industrial astronaut candidate:

  "Lockheed Martin put me through the astronaut training initially to support the design process for spacecraft and interfaces. But as time went on they realized there was another opportunity to actually fly me as an astronaut with one of the payloads. They started to talk to some of the decision makers at NASA about the possibility of sending me up with, for example, the telescope or on one of the space station missions. And then the Challenger accident happened . . . which basically shut down the possibility for any private citizens or non-NASA personnel to fly in space for a while."

- Director of technology development and head of research and development at WET Design in Universal City, California, developing various hardware and software elements for the 900-foot fountain in front of the Bellagio resort:

  "During 1998 I spent a good part of my summer sitting on the sidewalk in front of the fountain on the strip in Las Vegas programming and developing a computer simulation for it. The air temperature was usually about 120 degrees and sometimes I was tempted to just jump in the water!"

If APU could develop something like that and ultimately share such a curriculum with other schools—that would be a fantastic service.

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Have you been invited to speak on other university campuses?

L W

I've spoken on technical subjects at other schools, such as various aspects of the space program or human factors and biomechanics. When I was in astronaut training at Lockheed, I spoke at schools occasionally about my own experiences. I sometimes talked about my faith as well, and how Earth is located in the perfect spot in the solar system to support life and was designed expressly for that purpose. But I certainly hope to get more opportunities to speak at other schools on matters of faith and science.

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And hopefully if things begin to really take off, other universities will take note and say, "Wow, we need to have a center like CRIS on our campus."

L W

Yes, exactly. One of the other visions I pursue is development of a science and technology center with a Christian worldview. Something along the lines of a Christian exploratorium—a place designed with all kinds of interactive science and technology exhibits tied in with faith. This would include research experiments in all the major areas of science. I would love to see a center like that established, because to my knowledge there isn't anything like it. There are many different science and technology museums, but none that I know of with a credible approach to science from a biblical worldview.

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I'm kind of curious, and maybe we've alluded to this, but what do you think about using science apologetics to reach people with the gospel?

L W

I think science can be used as a tool to knock down obstacles to a person's faith. People often feel like they've got intellectual barriers to hurdle because of the way science has been presented to them in the past. This can hinder someone from even considering faith in Christ. Science apologetics definitely serves as a device to knock down those obstacles. Specific facts can be used as a way of planting seeds. Give people something to think about and ponder and eventually that seed may take root and grow into faith.

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Considering the God of the universe—and the wonders we see all around us—how can we give proper credit for all of the fine-tuning and beauty?

L W

The deeper a person digs into the nature of the universe and creation, the more evidence he or she sees for the complexity and design. We begin to realize how statistically improbable it is that all these things came together by chance. That to me is one of the most convincing arguments: the improbability of all these different things coming together just right in order to support life.

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What would you say to encourage people, especially students, to get involved in science?

L W

The more we discover about the world around us, the more we discover about who God is—about the Person, the entity who created all of this. And the more we learn about how He created, the more we can appreciate who God is—how awesome He is, how careful He is, and, how caring He is toward humankind. So much that He designed things precisely in order that all things could work together to support us and be good for us. I would try to encourage people to study science—to study nature through science—as a way to learn more about God. ◉

CURRENT CONSULTING PROJECTS

- Fighter pilot proficiency studies at RAND
- NASA projects for the next-generation reusable launch vehicle (essentially the next-generation spaceshuttle); spacesuit design for extravehicular work.
- Crew interfaces and training procedures for Cargo Lifter, a company headquartered in Germany that is developing a huge blimp for intercontinental cargo transport.

  "This blimp will be immense—about 900 feet long by 250 feet high—that's three football fields long. It is being designed to carry about sixteen tons of cargo over about a 10,000 kilometer range."

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