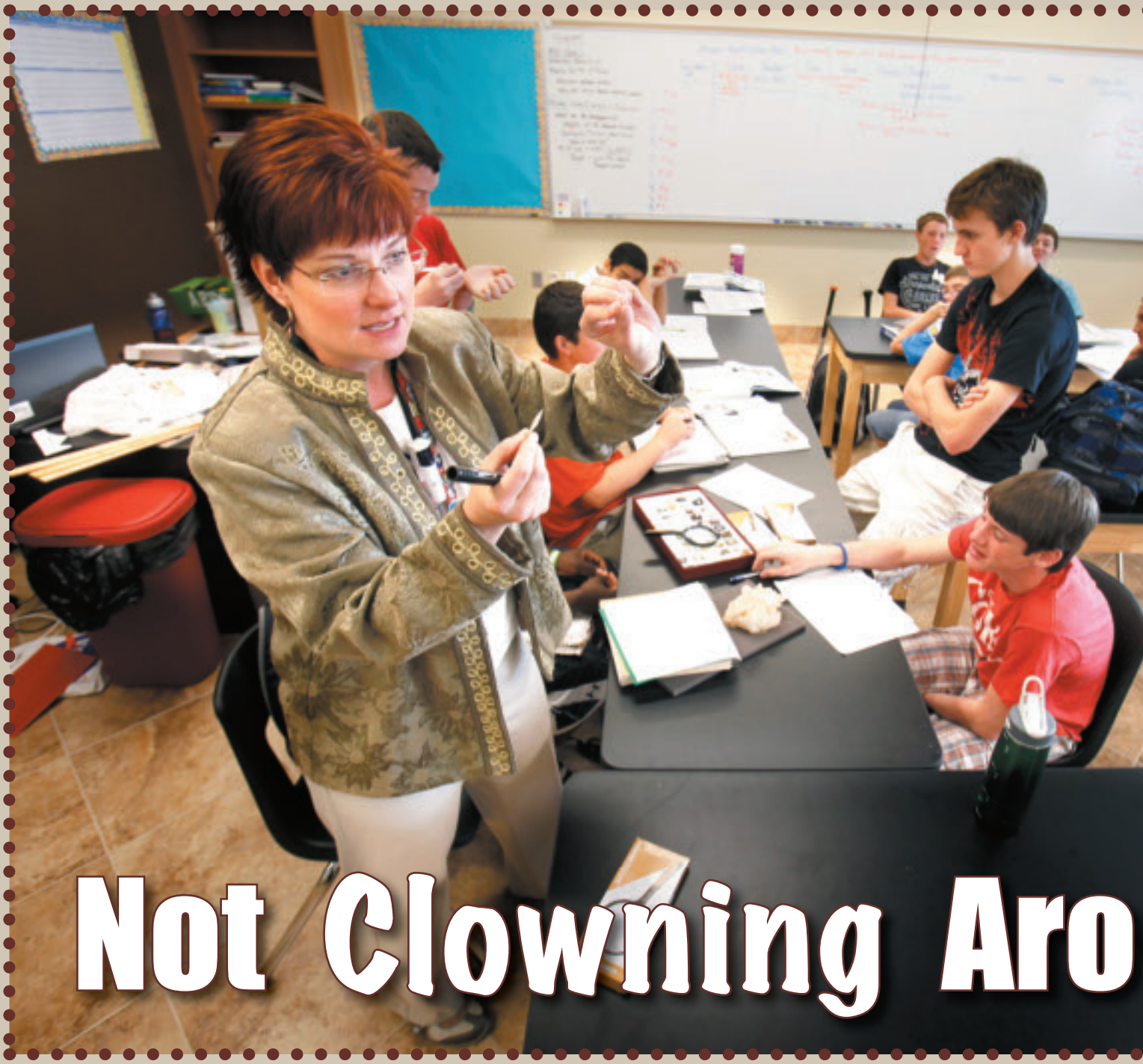

Not Clowning Aro

For her enthusiastic and effective work as an aerospace educator, Lori Bradner is AFA's National Aerospace Teacher of the Year.

When she was little, Lori B. Bradner wanted to grow up to be a Broadway star. As a self-described "girlie girl," the Flint, Mich., native was always dancing and singing, sometimes with a towel draped over her head to imitate the long hair of one of her idols, Cher.

She attended the local music institute, took vocal lessons in glee club, and practiced public speaking in front of groups. Eventually she took off for the footlights of New York and the life of a young actress.

"I'm a thespian from way back. That was my lifelong dream," she says today.

But life has twists—and sometimes takes sharp turns. Today, Bradner is one of the nation's top science, technology, and math educators. Vivacious and passionate about her subjects, she has drawn upon her drama background to make seemingly dry subjects sparkle in the classroom. She's done everything from helping students design a reduced gravity experiment for NASA's "Vomit Comet" to enlisting a Norwegian sister school for joint scientific exploration.

After serving as a teacher in the Central Florida Aerospace Academy in Florida's Polk County, Bradner is now executive director of education at Sun 'n Fun, a Lakeland, Fla.-based organization devoted to promoting aviation through fly-ins, summer camps, and

Photo by Ernst Peters/*The Ledger*

und

By Peter Grier

Lori Bradner instructs a class on mineral identification at the Central Florida Aerospace Academy in Lakeland, Fla., in 2011.

other events. It's safe to say she's the only winner of the Air Force Association's National Aerospace Teacher of the Year award who has both a B.S. in zoology/genetics and a Bachelor of Fun Arts degree from Ringling Bros. Clown College.

"There is no doubt my theater and performing arts experience helps," she says. "Whether you're teaching teachers or students in a classroom, it's a stage, it's a theater. I'm competing with cell phones. It's not really all about education anymore. It's edutainment."

Teaching is all about relationships, she says. It's about meeting people of all ages where they are, celebrating their strengths, and helping them recognize their talent, values, and gifts. "At the end of the day, if you can do that as a teacher, you have touched the future. ... What you give in teaching, you get back tenfold," says Bradner.

Lori Bradner is unit commander for the Civil Air Patrol squadron at Central Florida Aerospace Academy (CFAA). She's taking flying lessons herself. But the first half of her life revolved around performing arts and musical theater.

Not a Clown Question

Out of high school she earned a drama scholarship to the University of Michigan. Then, without telling her parents, she snuck away from Ann Arbor to Chicago to an audition for New York's American Musical and Dramatic Academy (AMDA). She thought her performance was terrible—"worst audition of my life," she says now—but the judges thought differently.

"I got a call saying, 'We're offering you a full-ride scholarship to come to New York City and come to school," she recalls.

After two years she earned an AMDA certificate and plunged into the life of a young aspiring New York City actress. That meant doing regional tours and waiting tables to meet the thousand-dollar price tag of her share of apartment rent.

Then on a whim she applied to Ringling Bros. Barnum & Bailey Clown College. A friend from her AMDA days told her about it, saying he thought it would be a good fit for her bubbly personality. Bradner got her acceptance call while rehearsing the role of Maria in a summer stock production of "The Sound of Music."

She said yes without looking back.

At Clown College in Florida she adopted the persona of "Oopsie" (a childhood nickname). She learned to juggle, ride unicycles, walk on stilts, and fall like a clown. Eventually she graduated with her BFA, a Bachelor of Fun Arts degree, and worked a season as a clown on the Ringling Bros. eastern tour.

She enjoyed it but sleeping in a cubicle on a train and moving constantly from place to place was a tough way to make a living. Plus, she still had no real university degree. So Bradner went back home and enrolled in Michigan State, majoring in zoology and biology. Her intention was to qualify for medical school.

"I was going to be the female Patch Adams," Bradner says, referring to the clowning real-life physician portrayed by Robin Williams in a movie of the same name.

But then another turn occurred. She found she enjoyed science and math—even had a talent in those areas. The extroverted ex-actress also liked the solitary precision of lab work. Eventually, she entered a doctoral program in physiology. She had completed everything but her dissertation when she got a call from Florida. Her mother, who by then lived in the Lakeland area and worked as a guidance counselor in local schools, was ill and needed her.

"I had to make a choice, and family came first," she says. "I will never regret it."

Bradner worked as a pharmaceutical sales rep, married, and raised four children. Along the way, she worked to earn a state certificate that would enable her to teach science. Prior to her move, she sometimes performed as Oopsie at her mother's schools. Kids loved it.

Finally, in 2009 she got a call from a Polk County Schools administrator who had worked with her mother and seen her school appearances. Would she like to apply for a job at the newly created Central Florida Aerospace Academy?

She got the position. Eventually she taught everything from honors biology and chemistry to environmental science and Earth and space studies at CFAA, which aims to prepare students for aviation-related careers.

"I went kind of a long way around to get where I am now," Bradner says. "But I believe there are no mistakes; things happen for a reason. I'm still learning and growing."

In Lori Bradner's ideal classroom, the teacher is not someone who hands down rote knowledge from a place of authority at the front of the classroom. They are not "answer givers" or "problem solvers," in her words. They are facilitators who help students develop the tools to inquire and produce solutions of their own.

She's not fond of textbooks. In the fast-moving fields of science they can often be out of date, and in any case, they're not intrinsically inspiring. Students are most engaged when they are given a hands-on problem to solve, she says. And aerospace-related projects are almost guaranteed to hook classroom interest.

"Anytime you mention a plane or a rocket, whether to a child of nine or an adult of 90, I have yet to have that person go, 'OK, that is very boring,'" Bradner says.

NASA has been a great partner for her in this educational area. She and her CFAA students began with a NASA-sponsored egg-drop competition, in which participants must design a way to drop an egg from a height such that it lands unbroken. Then they were chosen to participate in Down Link, a program where students communicate directly with astronauts on the International Space Station.

This led to Bradner's CFAA class being chosen to view the final launch of the space shuttle *Discovery* from a VIP seating area at Kennedy Space Center. Finally, CFAA students designed a reduced-gravity experiment and presented it to a group of NASA engineers. It was selected for completion aboard NASA's Reduced Gravity Flight, which simulates weightlessness via parabolic flight paths.

The experiment had its origins in foam. Bradner was teaching chemistry at the time, and the class was studying colloids—mixtures with particles of one substance evenly distributed throughout another. To illustrate the concept Bradner brought in everyday colloids such as shaving cream and other common foams. Among them was the kind of insulation in spray cans used to fill holes around pipes and other cutout spaces.

"I brought that in as an example," says Bradner. "A group of students said, 'Would this expand if it were in space?'"

Rather than provide the class with a ready-made answer, Bradner encouraged them to research the problem for themselves. They designed an experiment for the foam's expansion qualities in Earth's gravity to be compared to what happened in a zero G environment.

NASA picked the experiment for an actual test aboard the Reduced Gravity Flight, aka the "Vomit Comet." Bradner herself was given the opportunity to carry it out.

"I got to experience micro-gravity," she says.

She also got to bring out her costume and portray Oopsie in a floating environment. While Oopsie and crew were in the air, her clown character was recorded for safety promos for the Reduced Gravity Flight.

As to the results, the CFAA experiment showed that insulation foam sprayed into an empty two-liter soda bottle fills the container differently, depending on gravitational forces. On Earth, the foam just fills the bottle from the bottom up. In zero Gs it splatters everywhere within the container.

"It would fill it randomly. You would end up with a floating ball of goo," says Bradner.

Then, when the Vomit Comet hit the bottom of an arc in its roller-coaster flight path and the pilot pulled up the nose for a climb, the experiment was suddenly subjected to two or three times Earth's gravitational pull. This compressed the colloid foam, squeezing out its air pockets. That meant it was no longer good at insulation.

"You lost the integrity of the product," says Bradner.

Moving Forward

The bottom line of the effort might be summed up like this: If the US wants to construct a base somewhere with less gravitational pull than Earth—such as on the moon—it will have to consider carefully whether construction materials that work back home might be compromised in space.

Of course, space is not the only foreign environment Bradner and her students have connected with. Through a relationship struck up at a Sun 'n Fun aerospace event, she and CFAA began collaborating with a sister school in Norway that features a similar science curriculum.

The two schools have exchanged student and teacher visits in recent years. They have also worked together comparing Norwegian and American soil samples via a core-drilling project.

CFAA had obtained a grant from a local water management authority and Motorola to do core drilling in their area. On a visit to Norway, Bradner looked at the surrounding landscape and wondered if they could share resources for a compare-and-contrast soil test effort.

The final experiment was student-designed. The two schools did soil and water tests on roughly equal land—comparing agricultural areas in Florida with agricultural areas in Norway, for instance. Then they swapped data with their international counterparts via Skype and social media. Given the time difference, this could have been a problem.

"I had students that would literally come to school at six o'clock in the morning" to Skype with Norway, says Bradner.

This international relationship has now expanded to an experiment involving the University of Oslo, among other sponsors, with classrooms tracking ships using new satellite technology. By the time a contingent of Norwegian students came to the US last year to compare notes, the partnership was working smoothly.

"If you looked around and didn't listen to the accents you would not have known which student was which," says Bradner. "We had built a commonality."

For all of this enthusiasm and classroom innovation, Bradner's superiors recommended her wholeheartedly for the AFA Teacher of the Year award.

"Lori is the quintessential optimist; the effervescent intellectual; and the scholar whose heart is bigger than Texas," wrote Sherrie B. Nickell, Polk County School Board superintendent. "She is one of the brightest people I know, yet with an incredible creative and charming personality."

Bradner credits her students for much of what happens in her classrooms. It was the kids who asked to reach out to other nations and form some sort of international alliance, she said. It was a group of students who came and asked her to help them establish a Civil Air Patrol squadron.

"Students are very open-minded. They think bigger," she says. "Because of technology, the world is becoming a very small place."

She has continued to move forward in her career preparation, recently earning a master's in educational administration from Purdue University. Her new position at Sun 'n Fun may enable her to expand her influence even further. As educational director of a nonprofit organization that produces some of the nation's largest gatherings of general aviation enthusiasts, she can help teachers throughout the region augment their science, technology, engineering, and math lessons.

"I can bring a plane that we can set out in your courtyard and we can talk about force and motion," she says. "We are going to help you teach the students so they not only understand the concept, [but] they can touch, see it, and feel it."

Looking back on her career thus far, Bradner says, "I have died and gone to heaven." ■

Peter Grier, a Washington, D.C., editor for the Christian Science Monitor, *is a longtime contributor to* Air Force *Magazine. His most recent article, "Halvorsen," appeared in March.*