



When the Challenger went down, the national space program suffered a traumatic setback. OU's Teacher-in-Space never lost the faith which she continues to transmit to Oklahoma youths in an exciting summer Aerospace Academy.

Touching the Future



By Ben Fenwick



This summer, the University of Oklahoma will take one giant leap for youths in science and mathematics education when the Oklahoma Aerospace Academy opens its doors with NASA Space Ambassador Freda Deskin as its director.

Operating as part of OU's Center for Aerospace Programs, the Academy will be held June 3-8 and 10-15. One hundred school children ages 10 through 15 will receive hands-on education at the week-long camp about how to live, work and learn in space.

Participants in the Academy, or "cadets," will play, eat, study and solve problems together on a simulated space shuttle mission. An advanced session will follow for teens, ages 16 through 18, June 25-27.

The cadets will encounter situations during the Academy designed to tax their abilities in math, science and computers. At week's end, they will have learned that to solve problems, they must use not only their own minds, but each other's. To receive a true education they will learn they each must give the best of their own "right stuff."

Deskin says the Aerospace Academy experience will make the youths feel comfortable with the idea of going into areas of science, engineering and math and prepare them for careers important to the country's future.

"It's not just an activity about living on a space station, but it's a fantasy—one that motivates them to learn," she says. "Since space cuts across all content areas, they're not just learning facts about science in isolation, or



Carrie Campbell, program coordinator for Oklahoma Aerospace Programs, manipulates a robotic instrument during last year's space camp.

facts about math in isolation. Those concepts are interwoven in the space missions."

In addition to learning about space, the students will learn about OU by interacting with many of the University's faculty. For many of the students, it will be their first experience in a university environment.

"When they come to OU, they will be on the campus, and everywhere they look, they will see academics," notes Deskin. "We want to involve as many faculty as possible in our camp to be role models for these students. We want these students to see them and say, 'Hey, I can do that. I can be that.'"

Deskin's own attraction to space began in her youth. In the front yard

Lying on her back and staring up at the sky, she watched the jets speed past the threshold of sound and fly up to the edge of space.

of her father's home, just outside of a Yuma, Arizona, experimental jet base, a young Freda Deskin first felt stirrings that would lead her to become one of Oklahoma's two NASA Space Ambassadors.

Lying on her back and staring up at the sky, she watched the jets, pushed by the test pilots who flew them, speed past the threshold of sound and fly up to the edge of space.

"I'd see how tiny the planes were," she remembers. "I'd been to the air base and had seen how big they were in reality. I wondered if they could see the whole earth from up there, and if it looked small, like a map. I had a fascination with wanting to see the whole earth."

The desire to share that fascination with others inspired Deskin to enter the Teachers-in-Space program in 1985. Although not selected for the actual space flight, she remained committed to the education of youths and adults about aerospace careers. Even the disheartening Challenger disaster in 1986 and the loss of colleague Christa McAuliffe failed to dissuade her.



Space camp participants belong to a squadron and complete a mission, during which they work as a team and individually, learning how to solve problems using math, science, and what NASA Space Ambassador Freda Deskin calls their own "right stuff." Upon completion of the mission, camp directors stage a celebration — complete with confetti and streamers — to honor outstanding cadets.



Deskin, whose own fascination with space began when she was about the age of this would-be astronaut, helps the young cadet into a helmet. Those enrolling in the camp love it so much they return again and again, to the point that the Academy's curriculum, a cross-section of disciplines, had to be revamped.

When she was designated a NASA Space Ambassador, she founded the Oklahoma Aerospace Academy so others can learn what awaits them in the future. The motto of McAuliffe's mission, "I am a teacher. I touch the future," is now reflected in Deskin's work.

Under Deskin's guidance, together with a board of directors, the Oklahoma Aerospace Academy operated for three years on its own as a non-profit organization, partially funded by a parent organization, the Oklahoma Aerospace Foundation.

Now the Academy is OU's recent acquisition in one of its newest and most promising extension enterprises, the Center for Aerospace Programs, housed in the Oklahoma Center for Continuing Education. Bringing the Academy to OU was a goal long in Deskin's mind.

"Other universities invited us to come and look them over, made us offers and told us what they would do for us," she says. "But we felt that OU—and Norman—were really getting into aviation and aerospace. It only made sense we should go with the major research university."

Richard Little, director of the Center for Aerospace Programs, says the success and quality of the Oklahoma Aerospace Academy makes it the "most visible" part of the Center, drawing favorable nationwide attention to OU. Deskin's NASA background, her doctoral work in the OU College of Education and her presence there as a faculty member made her and the Academy "a natural" for inclusion in the Center, he says.

"It's an opportunity to put our best foot forward," Little says. "It's a tremendous way to present not only an outstanding program, but also to present to those young people and their parents the whole University as a resource."

The addition of the Academy makes sense not only with the University's research focus, he continues, but also fits neatly into the Strategy for Excellence, OU's guiding plan for the academic future.

"It deals with youth and ties directly into President Richard Van Horn's commitment for recruiting the best and brightest kids," Little says. "It's an opportunity for those kids to in-



ABOVE: Richard Little, director of OU's Center for Aerospace Programs, helps Deskin with logistics involved in orchestrating this summer's Academy.

RIGHT: Her desire to share space knowledge led Deskin to NASA's Teacher-in-Space program and then to found the Oklahoma Aerospace Academy, which OU has acquired through its Oklahoma Center for Continuing Education.



teract with our best faculty in an inspirational and fun environment."

In addition to the Academy for youths, a version will be available for adults and senior citizens. The adult camp, for ages 19 and older, will run June 29-July 1. The senior camp, for ages 60 and older, will be offered July 18-20. University credit can be obtained for attending these academies.

The Academy's participants will be housed on campus at the Cross Center dormitory, and daily meals will be provided. Plans are to conduct the Academy at OCCE facilities.

The core of the Academy's curriculum is a simulation of a space shuttle mission. Once the cadets arrive, they are put into teams, or "squadrons," of 25, each named after a NASA space program, such as Gemini or Apollo.

Next, the squadrons are split into teams for mission training. Each team member is given a position analogous to one on an authentic NASA shuttle flight. One team is assigned to crew the space shuttle, Pegasus, named for

the mythical Greek flying horse. Another mans the orbiting space station Daedalus, named for the ancient Greek hero who flew from captivity on wings made from thread and wax.

With a third team running "mission control" in another room, all members of a squadron are connected to each other through communication headsets, closed-circuit TV and a script devised by the Academy staff.

The cadets practice all week for their mission, learning how to work in teams and how to solve problems using math, science and their own skills and ingenuity.

Then, the squadrons compete against each other on a simulated space mission using the Academy's 30-foot space shuttle mockup.

"The simulated missions have the excitement and the realism of a real space shuttle mission," Deskin says. "Whatever position the cadets have, whether they are going out into the cargo bay and putting together some type of space structure, or they are car-

rying on laboratory experiments in Daedalus, they know they are going to have problems they have not experienced before."

After completion of the mission, the students are graded. Healthy competition between squadrons is encouraged. The performance of individual students is also compared with test scores of actual astronauts. Often, Deskin claims, the youths fare pretty well in the comparison.

In addition to the big mission, the cadets also are rotated into the other classes addressing aerospace subjects. They learn about aviation careers—not just about being a pilot but other areas as well. The classes require hands-on inquiry learning, where the students learn by doing and being involved. They also are taught how airplanes fly.

The cadets will design, build and launch their own rockets. Using principles of architecture, they will design a space station, build it to scale and present it to the class. They also will

work with robotics, programming actual working robotic arms. The groups must design a mission patch, with the winning design used to represent their squadron's mission.

This year's camp will feature, for the first time, a neutral buoyancy tank, where the cadets will assemble a structure under water to simulate weightlessness. The underwater construction activities will be conducted at OU's Murray Case Sells Swim Complex, under the watchful eyes of trained personnel.

"That's the way the astronauts actually train for weightlessness," Deskin says. "We have two instructors who are licensed in scuba diving, plus several student instructors. The cadets will be trained how to use the equipment, then they will go under the water and put a structure together. Cadets will have to communicate under water using sign language."

The curriculum in the Academy requires cooperative learning. Projects are designed so that a cadet group cannot succeed unless all members cooperate. Each cadet has to put in place a piece of the puzzle, whatever it might be.

The staff at the academy consists of both educators and professionals from the aerospace field. Architects work with the cadets on the design of their space station. Medical professionals perform the same tests on the cadets that are conducted on NASA astronauts.

As the Academy's record indicates, the students love the activities. They return again and again, so much so that the Academy had to be expanded into advanced versions when many of the returnees outgrew the original curriculum.

To build such enthusiasm for learning is something any teacher would want. But what makes outer space so important for OU's summer activities? Why not, as many colleges and universities are doing, simply have a computer camp?

Little says the Academy is much more than just computers.

"A space camp is comprehensive. Computers are a piece of the puzzle, but not the whole. It is a five-day academy where students live and work together. They learn team-building skills."

Those skills, he says, introduce the students to a cross-section of disciplines, including architecture, aerodynamics and communications. But more importantly, the cadets learn people skills.

"They have to deal with decisions other people make in an environment that will affect their livelihood in space," Little says.

Jim Pappas, vice provost for continuing education and public service, says one of the reasons he sought to locate the Academy at OU is because it introduces potential University students to a variety of career options in a learning environment that is also fun.

"If you tell a kid, 'let's work on computer mathematics,' they say, 'Uhhhhgg,'" Pappas says. "But if you say, 'let's figure a trajectory so we can rocket out of the atmosphere,' suddenly it becomes a different kind of task."

"They will be making the decisions in the future. Maybe we need to go to Mars, and maybe we don't."

"The Academy also brings to bear resources unavailable in any other setting," he says. "Even if students don't want to end up in space, at the Academy they work with computers, fitness, space medicine—all could lead them in the direction of a career. And the thing that is neat about it is they are doing all that within a framework that is fun."

What is the goal of the Oklahoma Aerospace Academy at OU? To give students a chance to find out what they can accomplish, both with others and within themselves, Deskin says. It will give them a taste of what it means to develop skills and knowledge in the aerospace industry.

"Why is aerospace education so important? A lot of reasons," she says. "As technology has increased, it requires more than basic arithmetic to get by. Technology demands more. Technology is changing faster than education is."

In a world where the space age permeates nearly every aspect of life, from cars to personal computers to clothing to medicine, a detailed understanding of math and science will become more and more a necessity, Deskin predicts. Yet, she adds that a recent report from the National Science Foundation shows that most Americans are not keeping up the pace.

The report revealed that of a pool of several thousand adults surveyed, only 45 percent knew the earth revolved around the sun once a year. Thirty-six percent knew lasers worked by focusing light waves, and only 26 percent knew antibiotics were effective only on bacteria.

Into the rapidly-changing future is thrust today's youth. In the year 2000, the average college student will be 22; half of them will be minorities. The time to address their educational needs is now, Deskin says.

"We don't want to reach just the top kids in class or just those in math or science, but also the ones considered average. We want them to learn that math and science are going to be necessities," she says. "We know we cannot create any more kids who are going to be there the year 2000. We've got one shot."

Unless the current trends are halted, she says, many of the careers chosen by those students will not be technologically oriented. This is an ominous warning for a country considered to be the world's leader in technology, and for a research-oriented university.

Deskin believes the Oklahoma Aerospace Academy can have a hand in shaping tomorrow. She hopes a summer week at the Academy will help produce a better-informed citizen, one able to make decisions to change tomorrow. And later, votes cast at polls by today's Oklahoma Academy youths will be educated ones.

"They will be making the decisions in the future," Deskin says. "Maybe we need to go to Mars, and maybe we don't. Maybe we need to spend \$5 billion on Star Wars, and maybe we don't."

"They will be more in tune with the future and will see how the pieces fit together and how their jobs and lives will be touched by technology. They will have a better view of the big picture." 