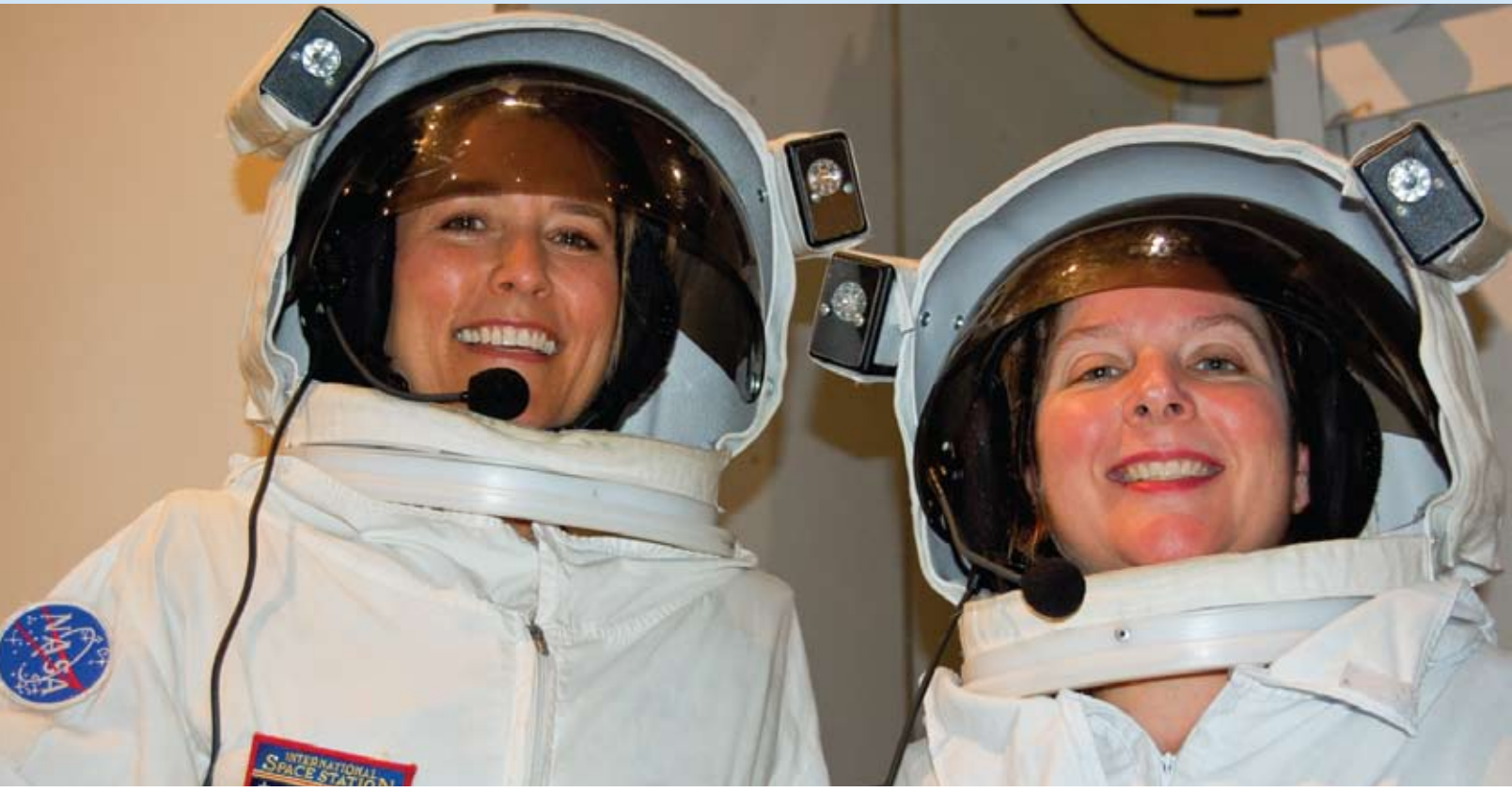
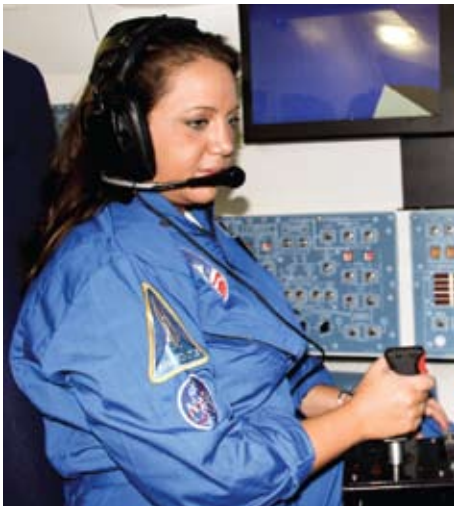
Boeing invests in lifelong learning—from childhood education to adult career development—as a key strategy for building the talent and critical skills necessary to meet the current and future needs of the aerospace industry. Beginning with this issue, *Boeing Frontiers* explores how Boeing, itself a continuous learning organization, collaborates with primary and secondary schools, institutions of higher education, and government, industry and community organizations to promote and guide learning over a lifetime. In this first installment of an ongoing series, Frontiers presents a collection of stories about nurturing development and learning during the critical school years.



Mission **success**

Boeing inspires lifelong learning in others

By Adam Morgan



With a calm look on her face, April Davis donned her spacesuit and began to mentally prepare for the upcoming mission. In just a few minutes, Davis would board Space Shuttle *Endeavour* and then travel at speeds up to 17,500 miles per hour (28,000 kilometers per hour), 220 miles (350 kilometers) above Earth, on her first mission to the International Space Station—a mission she's been training for all week.

Most astronauts train for years before their missions, but Davis is no ordinary astronaut. In fact, she's not an astronaut at all. She is a fifth-grade teacher at Windsong Intermediate School in Friendswood, Texas. And the "mission" is a simulated one, part of her week at Space Camp, courtesy of The Boeing Company.

Each year, Boeing partners with the U.S. Space & Rocket Center to sponsor educators from around the world at its Space Camp facility in Huntsville, Ala. This year marks the 18th anniversary of Boeing Educators to Space Camp. Since 1992, nearly 700 teachers have participated in Boeing's annual program, reaching more than 30,000 students.

"I'm thrilled to be a part of this," Davis said. "There are so many cool projects we do at Space Camp that will be hugely successful in the classroom—projects such as

"Enabling educators to attend Space Camp each year is just one of the many ways The Boeing Company is investing in the future of space exploration."

– Brewster Shaw, Boeing Space Exploration vice president and general manager

bottle rocket launches and heat shield exercises that are fun and educational and will get students at all levels excited about learning."

This year, Boeing brought more than 75 teachers from 10 countries to participate in the weeklong course, continuing to expand the diverse, global network of educators attending Space Camp.

"We want to work with the world's educators to inspire students and use space exploration as a way to help spark their interest in math and science," said Rick Stephens, Boeing senior vice president of Human Resources and Administration. "By sponsoring Educators to Space Camp, Boeing is helping the students of today become the citizens of the future and the next generation of scientists, engineers and space explorers."

The program uses space exploration initiatives to enhance teachers' skills in presenting math, science and technology lessons that will inspire students—and ultimately help build a skilled work force for a globally competitive technology market.

Throughout their week at camp, the teachers participate in hands-on workshops that include simulated space missions and astronaut training as well as presentations by rocketry and space-exploration experts. The workshops help bring the excitement of real-world engineering challenges to levels suitable for students so they can better understand scientific and mathematical principles. The teachers also receive resources to augment what they teach in their classrooms, to help students meet national standards for science, math and technology.

"Enabling educators to attend Space Camp each year is just one of the many ways The Boeing Company is investing in the future of space exploration," said Brewster Shaw, vice president and general manager of Boeing's Space Exploration division, headquartered in Houston, and a former astronaut. "The number of students pursuing math-, science- and technology-related degrees is declining, particularly in the United States. It is important that we work with educators, who have a direct influence on the students starting at a young age, to bring the excitement of these subjects into the classroom. The teachers' experiences at Space Camp will give them a unique perspective to share with their students."

Boeing's support of Space Camp aligns with the company's community investment focus area in primary-secondary education, which promotes the professional development of teachers and provides them with the tools and resources they need to help improve student performance.

"Space Camp provides a hands-on learning environment where the excitement of science, math and technology are explored and practiced through the mysteries and wonders of space," said Katrine Balch, director of Education at the U.S. Space & Rocket Center. "For educators, Space Camp provides a place to become a learner again and to join with other educators who share the same passions for teaching and learning."

After graduating from Space Camp, each teacher returns home with CD-ROMs filled with lesson plans and additional program materials to use in the classroom. The graduates also receive information about online educator resources to facilitate continued networking with fellow camp attendees. Additionally, Boeing is requiring participants to work with their school administrators to develop a plan describing how they intend to implement what they learned at the camp in their school or district.

"I've learned a lot and made some great connections with teachers from around the world," Davis said. "I can't wait to share this experience with my students and other teachers around the district." ■

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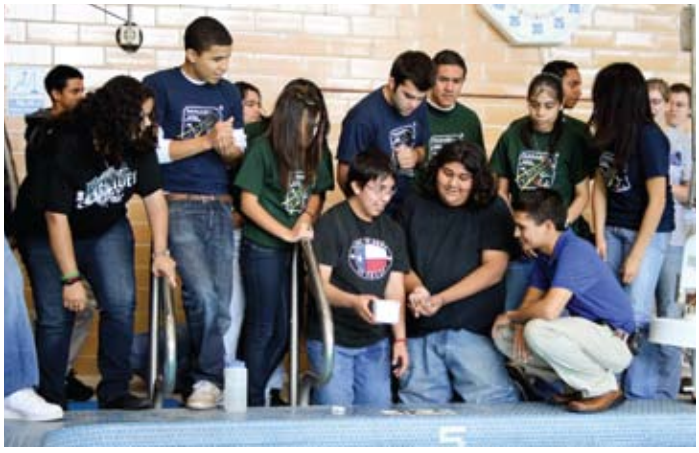
PHOTOS: (FAR LEFT, TOP) Teachers Rhonda Bristow (left) of Richardson, Texas, and Tamara Edmondson of San Antonio conduct a science project on the International Space Station at Space Camp. DALE RAINVILLE/BOEING

(FAR LEFT) Teacher April Davis of Friendswood, Texas, spent her week at camp in hands-on workshops including simulated space missions and astronaut training. ADAM MORGAN/BOEING

(TOP) Teachers Carlo Tripodi (foreground) of Italy and Kee Taek Hong of South Korea participate in a simulated spacewalk during Space Camp. DALE RAINVILLE/BOEING

New engineer shares DREAM



By Ed Memi

Engineering is probably not at the top of the list of fun things to do for the average high school student. But Tony Castilleja Jr. has never settled for average—not in high school, not as a student at Rice University and not now as a new Boeing employee. Castilleja is absolutely passionate about engineering and is doing a lot to share that passion.

In May, Castilleja joined Boeing as a full-time employee, following a three-summer internship at Boeing Space Exploration in Houston. The internship was through INROADS, an organization dedicated to developing and placing talented minority youth in business and industry and preparing them for corporate and community leadership.

So it was fitting that, also in May, Houston Mayor Bill White honored Castilleja at a Houston awards dinner for all his volunteer work helping high school students realize they can succeed in college and achieve fulfilling engineering careers. Castilleja received the Volunteer Houston Award in part for creating the Designing with Rice Engineers and Achievement through Mentorship (DREAM) program, which matches Rice engineering students with high school students.

As part of DREAM, "students from Rice mentor kids every day after school for up to seven weeks on engineering projects," Castilleja said. "The design project provides a natural environment in which to spur a mentoring relationship."

The mentoring program has translated into an increased understanding of engineering for the students, and for many a realization that they can attend and succeed in college. "Many of these students don't realize the opportunities that engineering and college present," Castilleja said. "When university students tell them that with engineering degrees they can launch space shuttles, build satellites or build next-generation aircraft, they get excited. Their next question is: 'How can I get into college?'"

Despite his demanding day job, Castilleja plans to continue leading DREAM for several reasons: "I am eternally grateful to Boeing's internship program, my mentors, INROADS and the people at Rice University who gave me the opportunity to challenge myself," he said. "It's time for me to give back."

As an intern, Castilleja worked on pre-flight and post-flight analysis on the solid rocket boosters; he now is focused on pre-flight and post-flight analysis of the pressurization system for the space shuttle. One of his goals as a student and intern—which he's since realized at Boeing—was to work in mission control during the shuttle's launch and landing. "It is always an amazing experience to be a part of sending humans into space," he said. "I've been able to share that experience with the students, and they're amazed at what studying engineering can lead to." ■

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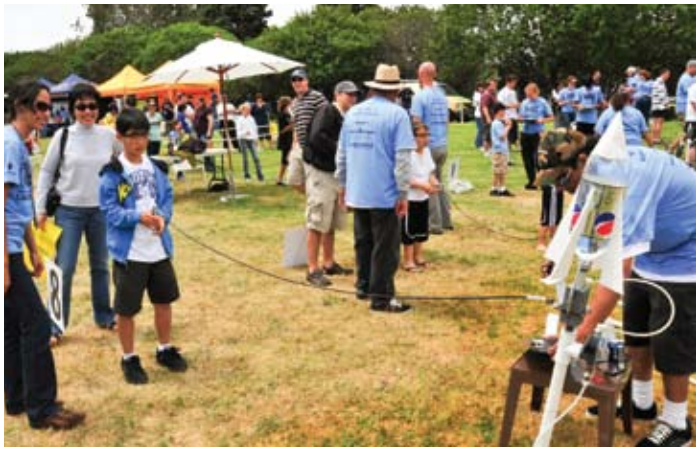
PHOTOS: (TOP) Boeing space shuttle engineer Tony Castilleja Jr. was one of 12 honored at Houston Mayor Bill White's Volunteer Houston Awards dinner earlier this year. Castilleja received the award in part for his efforts in creating the DREAM—Designing with Rice Engineers and Achievement through Mentorship—program. It matches Rice University engineering majors with students at three local high schools. ELIZABETH H. MORRELL/BOEING

(ABOVE) Boeing space shuttle engineer Tony Castilleja Jr. advises Austin High School students during a DREAM competition last year at Rice University, Houston. NATILA SALIES/RICE UNIVERSITY

Launching engineering careers one rocket at a time



By David Sidman
Photos by Steve Fassa/Boeing

Jack Byers stepped up to Launch Pad No. 6 at Boeing Huntington Beach, Calif., peering through safety goggles slightly too big for his face. A flight technician provided the requisite 3, 2, 1 countdown, and at zero, Jack squeezed the launch trigger. He watched intently as his creation burst quickly into the sky—and just as quickly came back down to Earth. But Jack was elated. After all, he is 6 years old and just experienced his first flight test.

While performing pre-launch activities with the other Jack Byers—his father, who works for Boeing Creative Services—Jack, the junior, shared his objective for the day: "I hope my rocket goes all the way to the sky!"

Nearly 1,000 other kids of all ages hoped for the same thing as they took part in Launch 2009 earlier this year, where they designed, built and launched "rockets"—each one an empty 2-liter bottle with cardboard fins and a parachute perched under the rocket's cone to slow its descent. Add some water and pressurized air, and up the rockets went. Boeing hosted the event in conjunction with the Discovery Science Center of Orange County and the Future Scientists and Engineers of America organization.

"This was a great family event where kids worked with their parents to accomplish a goal—to launch a rocket," said Rick Baily, vice president and general manager of Boeing Combat Systems and a member of the Discovery Science Center's board of directors. "This is all about inspiring the next generation of engineers through hands-on learning and experience."

In many ways, the kids' experience building bottle rockets mirrored real-world engineering. First, safety was paramount on the flight line. Behind it, at 30 very busy workstations, kids wrestled with design and build challenges. The critical path for most was designing and installing the parachute to deploy during the rocket's descent. Holding a post-launch BDR—bottle design review—with her son, Jared, Nancy-Kim Yun of Boeing C3 Networks troubleshooted their rocket's parachute problem. It was a hardware issue. "I need a new cone," Jared decided.

And when siblings or parents couldn't help, Kristen Levengood could. An engineer with Boeing Research & Technology, she shared rocket-building advice while answering general aerospace questions. "It's a lot of pressure," she admitted, despite her degree in aeronautics and astronautics from the University of Washington.

Launch 2009 ended with another real-world exercise: FOD removal. Kids scoured the lawn picking up foreign object debris left behind after a busy day of building and launching rockets. ■

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PHOTOS: (LEFT) Kristen Levengood, Boeing Research & Technology engineer, answers rocket design questions during Launch 2009. **(RIGHT)** C3 Networks' Nancy-Kim Yun and son, Jared, prepare to launch their rocket during Launch 2009.