

Students Combine Wonder and KC-135 Weightlessness

By John Ira Petty

These young people were soaring, psychologically, scientifically and literally. You could see it in the way they talked about their experiments and their experiences on NASA's KC-135 "Weightless Wonder."

The college students, about 180 of them in 47 teams from across the United States, participated in the March 2000 College Student Campaign of the NASA Reduced Gravity Student Flight Opportunities Program.

They took microgravity experiments they had designed from their laboratories into the reality of weightlessness on the aircraft. They learned some valuable lessons, beginning with teamwork, creativity, scientific discipline and, in some cases, how to overcome and work through obstacles – ranging from personal discomfort to balky experiments.

The enthusiasm was evident as they got off the airplane. "It's probably the greatest program, the greatest collegiate activity I've ever been involved in," said Scott N. Ringel, University of Alabama at Huntsville. "One of my teammates had flown before, and he kind of described it, but it wasn't even close. It was just unreal."

The Johnson Space Center plane, a military version of the Boeing 707, has seats in the rear, but much of the cargo area is empty space encircled by the padded interior of the fuselage. Student



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experiments, as many as eight per flight, are secured to the floor.

The KC-135A is used to train astronauts and test equipment. NASA's Reduced Gravity Student Flight

Opportunities Program, operated by Johnson Space Center, is in its fourth year. It is funded by the space agency and administered by the Texas Space Grant Consortium in Austin. It provides opportunities not only for college students but for community college and high school students as well. High school students will fly in April, as will community college students. A fall session will host college students.

The plane achieves

weightlessness by flying in precise up-and-down maneuvers over the Gulf of Mexico – up at a 45-degree angle, "over the top" and then down at 45 degrees. Zero gravity lasts for about 25 seconds on each flight's 30 to 40 parabolas.

Each of the college teams flew its experiment twice in March. Two team members flew on the first flight, and two others on the second flight. Journalists accompanied about half the teams to report on their experiments and activities. Each person who flew received physiological training before flying, and each experiment was carefully evaluated for safety.

Donn Sickorez, university affairs officer at Johnson Space Center, said the center does indeed touch the future with this program. "It's really good to see the kids come in. They're excited. They give you a new perspective, and a jolt of energy."

Weightlessness gave the students a new and remarkable experience. Jeran S. Hill of Alabama A&M University said the sensation really was almost like a roller coaster, but that the sensation persisted. "That was really weird." But, he continued, "I'm really enthusiastic about the program. I certainly enjoyed myself – it's worth it for the experience alone."

Julie Stahmer of the University of Michigan said that before the flight she had no idea what to expect. "It was lots of fun," she said, especially since their experiment appeared to function well. "I'd go again."

Her teammate, James Kanavage, said the experience was "completely unlike anything I expected – a lot better than I thought. The neat part was going into zero g, when things started floating by."

A lot of Johnson Space Center people work hard to make the student flights successful. They have their own rewards. John Yaniec of the Aircraft Operations Division displayed an enthusiasm as boundless as that of the students. "Everything worked really well with the kids," Yaniec said.

Mike Fox of Kelsey-Seybold who did the physiological training said the students were "enthusiastic and rarin' to go. All of them show a lot of dedication to the program. They were thrilled to be here. Several of them asked about center employment opportunities."

The students did get a good look at Johnson Space Center, and were told about the co-op programs and post-college employment opportunities. Both contractors and JSC cooperative education students sponsored activities for the students while they were in Houston.

Many students said they were impressed with what they saw. It wouldn't be surprising to see some of the March participants back at the center, perhaps as astronauts, flight controllers, scientists or engineers. ■



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Above left: Alabama A&M University students Jeran Hill, left, and Kelly Moon, right, work on an experiment titled "Measurement of Ambient Acoustic Power Spectrum on the KC-135 and its Perturbative Effect."

Above: Montana State University-Bozeman student Connie Nelson works on an experiment on the flight behavior of bees and how growing roots react in microgravity.

Right: University of Cincinnati student Michael Volle works on a study of how to maneuver nanosatellites without on-board propulsion.



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