

KnoxNews.Com
(The Knoxville News Sentinel)

NASA know-how

UT students visit agency to test water flow in space

By **J.J. STAMBAUGH**, stambaugh@knews.com
April 19, 2004

One group of University of Tennessee students opted to spend their spring break in a different way this year: at NASA headquarters in Houston, Texas, running an experiment that may one day help the U.S. space program.

Sheena Edwards, a junior studying biomedical engineering, said the group's eight members, all of them engineering students, with the exception of one physics major, helped design and maintain their own experiment into how heat is transferred in microgravity conditions.

"We wanted to see how water flows differently in space," Edwards said.

To further that end, the group -- which is dubbed AERO and occupies a small workspace in Dougherty Engineering Building at UT -- was admitted into a NASA program that allowed it to make use of the organization's "Weightless Wonder," a modified KC-135 transport airplane that can simulate microgravity conditions by flying in a series of carefully plotted dives and turns called parabolas.

"We had two runs, and we did 32 parabolas on each run to simulate microgravity 32 times, each time for 20 to 25 seconds," she said. "We have the results back, and we're analyzing them."

Jay Stembridge, a junior studying computer engineering, said the trip to NASA gave the group valuable insights into what they might expect after graduation.

"The trip itself was incredible," he said. "They took us on a bunch of tours of the different facilities and we got to see a lot of the scientific workings that not a lot of people get to see. It was really interesting to see what people out of school and in our fields actually do with their lives."

Stembridge said the experiment -- which looks like a large plexiglass box filled with tubes and water pumps -- revealed an engineering problem for future designers of power systems in space.

"Basically, when you're condensing water for a power system, you have to heat the water and then cool it down again, and this (experiment) was doing that in microgravity," he said. "The main difference was the way that water flows in a pipe.

"Because there's nothing (like gravity) to hold it to the bottom of the pipe, it flows around the outside, which interferes with the heat transfer between the fog and the heated surface."

This is the second year the project has been offered at UT. The students volunteer for the experiment and receive only a single credit hour, although Edwards said the experience was the real reward.

Getting on the KC-135 last month, however, was at first nerve-wracking, she said.

"At first I was really nervous," she said. "They we took off, and it was such a smooth ride. Then they told us we would hit two Gs (meaning their weight was about to double), and it felt like we were being shoved into the



NASA

University of Tennessee students Jay Stembridge, left, and Daniel Passmore experience microgravity with a stuffed Smokey, UT's mascot, on a KC-135 at NASA headquarters in Houston, Texas.

floor.

"That's when people get sick, but then you hit Zero G and you start floating."

The next step, Edwards said, is to analyze the data and send a report to NASA so the information can be compared with that gathered last year, she said.

The group's faculty advisers are professors Viatcheslav Naoumov, Lawrence Taylor, and Masood Parang, she said.

J.J. Stambaugh may be reached at 865-342-6307.

Copyright 2004, KnoxNews. All Rights Reserved.