

Student experiment microgravity kit wins NASA-Make tech contest

May 23 2011, By David E. Steitz and Ruth Dasso Marlaire

"Bring It Back," a small and inexpensive microgravity spaceflight kit, has won the do-it-yourself technology and education space competition sponsored by NASA and *MAKE Magazine*.

The competition challenged participants to design experiments that could be built for under \$200 by <u>high school students</u> to eventually fly on a suborbital flight. In addition to being low cost, the winning entry also had to illustrate sound science, technology, engineering and math (STEM) principles. The competition was designed to inspire curiosity and create interest in STEM among classroom teachers and students.

The "Bring It Back" concept, created by Houston engineers Prashant Rao and Subra Sankaran, outlines three experiments using molten wax to demonstrate important principles of science and engineering. Each experiment can be performed using the same equipment, making the kit versatile. The students will use wax to understand the dominance of <u>surface tension</u>, wetting effects and the impact of a lack of buoyancy in the absence of gravity. Other <u>science concepts</u> include simulated boiling, fluid flow behavior and bubble movements induced by temperature changes, natural convection, and wake flow.

"It is a challenge to create an affordable and achievable method for microgravity experiments, but the Houston team came up with three innovative options, using materials easily found in most communities," said Bobby Braun, Chief Technologist at NASA Headquarters in Washington. "As a result, students across the country will have the



opportunity to gain first-hand experience with some of the principles required in a career in science and engineering."

Sponsored by Teachers in <u>Space</u>, a project of the Space Frontier Foundation in Nyack, N.Y, the first "Bring It Back" kits will fly aboard the Excelsior STEM mission scheduled to fly on a Masten Aerospace unmanned suborbital mission later this year. Teachers and students will assemble the experiment kits at a Suborbital Flight Experiment Workshop at NASA's Dryden Flight Research Center's AERO Institute in Palmdale, Calif., in early August.

"At this stage of their lives, we think it is particularly important to provide an experience that will get students excited about science and engineering in general, and space in particular, all in an artistic and imaginative way," Sankaran said. He is a senior thermal specialist at MEI Technologies and Jacobs/ESCG in Houston. Rao is a principal engineer at Barrios Technology and Jacobs/ESCG in Houston.

Their kit was selected as the winner by NASA's Ames Research Center in Moffett Field, Calif., MAKE Magazine and Teachers in Space. Sankaran and Rao will be honored May 21 and 22 at the Bay Area Maker Faire in San Mateo, Calif.

"I believe that makers are inspired by the emerging opportunities for 'doit-yourself' space exploration," said Dale Dougherty, founder and publisher of MAKE Magazine, a do-it-yourself publication for technology. "We are proud to partner with Teachers in Space and NASA to encourage makers to develop space science kits that high school teachers can build and fly on suborbital flights. The project's ultimate goal is to open the door for the next generation of makers to gain realworld experience in space science. "



Provided by JPL/NASA

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