



## UA Student Leads Team to Zero Gravity

**Space Grant launches student's aspirations for lunar and robotic research projects.**

By Rebecca Ruiz-McGill, University Communications  
July 8, 2008

University of Arizona senior Yuridia Robeson has been looking forward to summer, but not for the reason one would expect.

On July 10, Robeson heads for NASA's Johnson Space Center in Houston and she takes a team of UA and University of Florida students to conduct scientific research aboard NASA's Weightless Wonder, a modified McDonnell Douglas DC-9 jetliner that takes 45-degree nosedives to simulate zero gravity.

The team's flight is part of NASA's Reduced Gravity Student Flight Opportunities Program. The program provides a unique academic experience for undergraduate students, who are



Yuridia Robeson, senior mechanical engineering major and NASA Reduced Gravity Student Flight Opportunities Program team leader



Yuridia Robeson standing by her Senior Day capstone project poster

asked to successfully propose, design, fabricate, fly and evaluate a reduced gravity experiment of their choice. Robeson said the proposal entails characterizing the properties and testing the resiliency of an ionic polymer metal composite that she hopes has possible merits for replacing heavier materials that are currently used for space operations.

Fellow UA students Jorge Sanchez and Alex Causey, senior mechanical engineering majors, and University of Florida mechanical engineering seniors Anthony Licari and Andrew McDonald will fly and test the composite as a possible alternative material to be used as sensor actuators for robotic arms, rovers and release mechanisms for space vehicles.

The reduced gravity aircraft generally flies 30 parabolic maneuvers over the Gulf of Mexico. This parabolic pattern provides about 30 seconds of hypergravity (about 1.8-2G) as the plane climbs to the top of the parabola. Once the plane starts to "nose over" the top of the parabola to descend toward Earth, the plane experiences about 25 seconds of microgravity (0G).

"I got the inspiration for the experiment from Krishen Kumar, a NASA chief technologist who had lectured on the composite's space applications during a NASA internship seminar I attended last year," Robeson said. She was encouraged by L. René Corrales, associate professor of materials science and engineering at the UA, to follow through with the proposal.

Robeson's experiment on the ionic polymer metal composite in zero gravity has never been tested in space.

The NASA-funded project provides students with experience in scientific research, hands-on experimental design, test operations and educational and public outreach activities and requires six months of preparation and nine days on site.

Robeson grew up in the small border town of Douglas, Ariz., where many

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**Extra Info |**  
[Space Grant Program](#)  
[NASA Microgravity University](#)

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students do not complete high school, much less go to college. As one of six children raised by a single parent, Robeson knew she had to do well in school to get an opportunity to go to college. "I was not prepared for college and did not know what to expect once I was accepted so I chose the school closest to home," she said.

Robeson's choice to attend the UA paid off as she found mentor-guided research through the prestigious UA/NASA Space Grant Internship. "Once I got the NASA grant, everything seemed possible," she said.

One of the missions of the Space Grant Internship program is to "marry education and research to give undergrads opportunities that would not be available in the classroom alone," said Susan Brew, program manager of the statewide Arizona Space Grant Consortium and the UA Space Grant Program. Following her Space Grant Internship, Brew continued to mentor and connect Robeson to educational opportunities in aerospace-related fields and encouraged her to gain experience Robeson never imagined.

"What really impressed me about Yuri was that as a sophomore, Yuri attended both the UA and Pima Community College full time, taking a total of 49 credit hours while maintaining a 3.875 GPA. While doing this, she found time to run cross country and participate on Pima's track and field team. She is a high achieving Hispanic woman, who helps incoming students learn to adapt to college life and become leaders," Brew added.

With Brew's encouragement, in 2006 Robeson applied and was accepted into the Massachusetts Institute of Technology Summer Research program. The MIT program recruits talented sophomores and juniors from throughout the country to work in research laboratories under the guidance of experienced scientists and engineers, who are MIT faculty members, postdoctoral fellows and advanced graduate students.

In 2007 Robeson also won the NASA MUST (Motivating Undergraduates in Science and Technology) Scholarship and with it earned a summer internship at NASA's Johnson Space Center.

She is also a part of the UA's Ronald E. McNair Post-baccalaureate Achievement program, which is designed to prepare participants for doctoral studies through involvement in research and other scholarly activities.

Robeson is currently at the NASA Robotics Academy in Maryland attending a highly prestigious summer program that selects only 12 to 15 applicants nationwide to study areas of research of high importance to NASA's space program.

She was given special permission to leave the intensive robotics academy to head for Houston and said, "I've learned the importance of networking and am thankful for the opportunities and people who have helped me along the way."