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NASA Stars...*

## Saucers, totes, cans, passion and dedication shape local students at JSC

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Flying saucers have landed at Johnson Space Center—and they are taking over the minds of our youth.

OK, so they are not *really* flying saucers. Those landed a few years back. Actually, this year they are totes and cans. Last year they were exercise balls.

But they definitely are shaping young minds, helping to create students who eventually become brilliant new engineers both at JSC and throughout industry. If you have been in Building 9 recently, then you may have noticed a sports-arena-like playing field that is the new home to the JSC/Clear Creek Independent School District (CCISD) robotics team, also known as “The Robonauts.”

“My passion is to open up engineering to students from a young age, to break stereotypes before they form and to expose the community to engineering,” said Robonauts “head coach” Lucien Junkin, who is also a mobility systems chief engineer in the JSC Software, Robotics and Simulation Division. “It is so inspiring to watch kids grow and to see them be excited and develop as engineers.”

Junkin embodies a passion for education and robotics; he lives it, breathes it, eats it and—if he slept—he would sleep it.

“We were up all night last night preparing for the students to come in today,” Junkin explained. “There are a lot of things we have to have prepared—things they cannot do, such as working with some of the heavy equipment. But always when we do that, we also learn and it actually helps us in our day jobs.”

For Inspiration and Recognition of Science and Technology (FIRST) Robotics has been a part of JSC and CCISD for 19 years and, from purely a competitive standpoint, it has consistently amassed top honors and a set of trophies that now spans the wall in Building 9. Although being competitive is important, Junkin actually lists it at the bottom of the four goals he and other volunteers have for The Robonauts.

“Goal number one is to educate the students in the field of engineering,” Junkin said. “The second is to grow the alumni family; FIRST often becomes a lifelong passion for those who get involved with it. The third is to expose the community to engineering, and the fourth is to be competitive. It’s last, but maybe it’s not the least.”

In fact, The Robonauts and FIRST Robotics are only the tip of the robotics and engineering education iceberg that has been created in CCISD over most of the past two decades with the help of JSC volunteers. Robotics and applied engineering initiatives start as young as third and fourth grades at schools in the district, an important age.

“My passion is to expose students to opportunities before societal stereotypes set in,” Junkin said. “At Moore Elementary, every student does a week of applied engineering—working with motorized Lego kits—every five weeks. At that school, 80 to 90 percent of all the students want to be on the robotics team. That tells you right there how important it is to change the stereotype of engineering early for kids. Even if they don’t pursue it, they will remember their experience and be aware of and better appreciate why others do pursue engineering and science.”

JSC volunteers help support engineering programs in CCISD now offered from third grade on: VEX Robotics, Boosting Engineering, Science and Technology (BEST) Robotics and FIRST Robotics, among others.

The legacy of The Robonauts sometimes has an even more direct benefit to JSC. Just ask Robotics Engineer Mason Markee in the Software, Robotics and Simulation Division. Markee became involved in BEST Robotics as a seventh grader at Seabrook Intermediate School in 1999, and it was then he first met volunteers from JSC who would one day become his co-workers.

“I grew up in Kemah, but I had no experience with NASA,” Markee said. “My parents weren’t engineers and didn’t work at JSC. I knew JSC was here and had maybe been there once on a field trip, but that was about it.”

For Markee, it was love at first build for engineering and robotics. “It was so much fun to compete and to build something with a purpose,” he explained.

While attending Clear Creek High School, he was on The Robonauts FIRST team for four years, becoming captain of that team as a senior, before attending the University of Texas (UT) and eventually becoming a cooperative education student at JSC.



Robonauts “head coach” and JSC Mobility Systems Chief Engineer Lucien Junkin mentors a team of students as they prepare the 2015 robot for competition. Image Credit: NASA



JSC Robotics Engineer Mason Markee, right, a 2006 Clear Creek High School graduate and veteran of The Robonauts FIRST Robotics team, mentors Alex Canizal-Dominguez, a student at Clear Horizons Early College High School, as they work on the current FIRST Robotics challenge. Image Credit: NASA



For almost two decades, teamwork has been the key ingredient for the JSC/CCISD FIRST Robotics Team, called “The Robonauts.” Image Credit: NASA



From left, 2015 Robonauts Team Captain Danielle Pettinger, a student at Clear Brook High School, and Chris Pulicken, a student at Clear Springs High School, drive the robot during a recent practice session in Building 9. Image Credit: NASA

"I didn't plan to work at NASA at all when I graduated from high school," Markee said. "I just wanted to be in engineering. It was not until I was at UT for a few years that I really understood the kind of work that was being done here and decided that I wanted to be part of it."

If you stroll through the robotics labs at JSC, there are many examples of FIRST veterans like Markee now working at JSC, who now volunteer to help the CCISD team. A few are veterans of local teams; others are from teams across the nation. Now, several high school students from area FIRST teams work at JSC in a Robotics Academy during the summer.

Markee volunteers supporting education activities, and the "pay it forward" nature of engineering and robotics programs is evident even in CCISD high school students. "Only a few students can be selected to be on the high school FIRST team, and those students aren't graded for that selection based on how much knowledge or technical ability they have," Markee said. "They are graded on what they do to support other students—at elementary and middle school teams and events, or in public outreach activities to support engineering and robotics education."

The 2015 Robonauts team is in full swing now. They recently won the Lone Star Regional event at George R. Brown Convention Center from April 2 to 4. Before that, they won the Sacramento Regional and Dallas Regional. They will compete at the FIRST World Championships in St. Louis from April 23 to 25.

The team's home is now in Building 9 after having previously been at Sonny Carter Training Facility for more than 10 years.

"It is great to be in 9," Junkin said. "The team is close to where we have many of our robotics projects, and it also allows the public to see how we inspire students. And you can see how excited the students on the team are to be in such a unique building. I cannot thank enough all those involved in finding the Robonauts a new home and supporting the daily activities, especially the Center Director's Office, Flight Operations, Center Operations and Engineering."

Danielle Pettinger, a senior at Clear Brook High School, is captain of the team this year. One recent evening in Building 9, she was practicing her position on the team as driver, controlling the robot. "I've been involved with robotics programs since second grade, when I did Lego League," said Pettinger, who is planning to attend either UT-Austin or the Colorado School of Mines next year. "I am going to try to leave next year, but I'll probably be back in here on a lot of weekends. The teamwork, the challenge, the friends—it is so much fun. It's the highlight of high school for me."

For more information on The Robonauts and JSC's involvement with engineering education in CCISD, visit: [www.Robonauts.org](http://www.Robonauts.org)

For more information about NASA's overall involvement in robotics education programs, visit: [www.Robotics.nasa.gov](http://www.Robotics.nasa.gov)

Find out what all the excitement is about and come see the JSC/CCISD FIRST Robotics team, The Robonauts, in action in Building 9 as they scrimmage from 2 to 7 p.m. on April 11. (Everyone is invited to come visit and bring their children (employees must personally handle any badging requirements).

James Hartsfield  
NASA Johnson Space Center

#### JSC and Community Robotics/Engineering Education By the Numbers:

19 years and counting  
25 First Lego League teams  
42 VEX IQ teams  
3 BEST robotics teams  
17 VEX Robotics teams



Clear Springs High School student Katie Brief works on part of the 2015 FIRST robot for The Robonauts during a recent practice. Image Credit: NASA