

# CITRUS CIRCUITS

## MARCH 2018

### UPCOMING EVENTS

**Sacramento Regional**  
March 21-24

**Central Valley Regional**  
April 5-8

**Houston Championships**  
April 18-21

### SPONSORSHIP UPDATES

**Jupiter**  
DJUSD  
UC Davis  
NVIDIA  
TechnipFMC

**Saturn**  
IFI

**Neptune**  
First St. Realty - Claire Slotton  
UC Davis School of Medicine  
UC Davis College of Agricultural and Environmental Sciences  
UC Davis College of Biological Sciences

**Venus**  
Aerometals  
DMG Mori  
Hill Engineering  
M Cubed  
SunPower  
UC Davis College of Engineering  
UC Davis College of Letters and Science  
UC Davis Global Affairs  
WestCoast Products

**Mercury**  
Far Western Anthropological Research Group  
Da Vinci Boosters

**Inkind/Other**  
Markforged  
Solidworks  
GitHub  
Fastenal

### LINKS

[www.citruscircuits.org](http://www.citruscircuits.org)

[admin@citruscircuits.org](mailto:admin@citruscircuits.org)

[facebook.com/frc1678](https://facebook.com/frc1678)

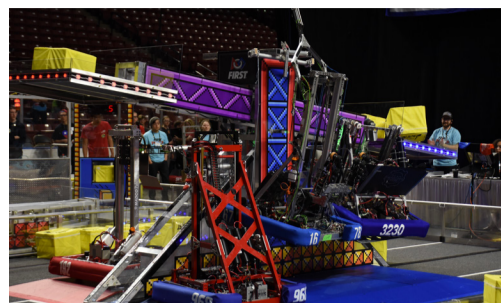
[twitter.com/frc1678](https://twitter.com/frc1678)

[instagram.com/frc1678](https://instagram.com/frc1678)

[youtube.com/citruscircuits](https://youtube.com/citruscircuits)

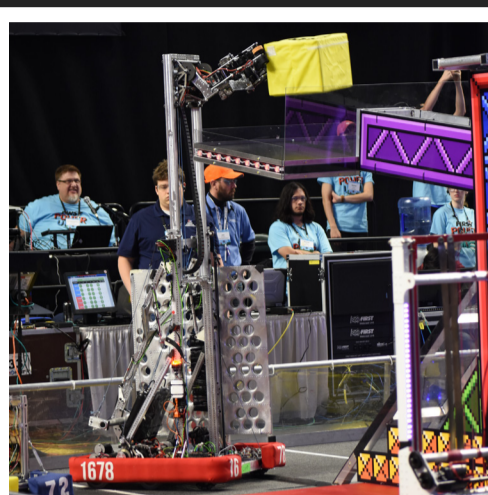
### CITRUS CIRCUITS WINS AT UTAH REGIONAL

From February 28 to March 3, Citrus Circuits members traveled to Utah to compete in the Utah Regional. We competed alongside 51 other teams from California, Idaho, Colorado, Texas, Utah, Wyoming, Montana, and Chile. We seeded first during the qualification matches, which allowed us to pick our alliance partners: Team 339 Eagle Robotics from Lancaster, CA and Team 1410 The Kraken from Denver. During finals, our team went up against another alliance, composed of Team 3230 PrototypeX from Salt Lake City, UT and Team 670 Homestead Robotics from Cupertino, CA and Team 159 Alpine Robotics from Fort Collins, CO. In addition to our regional win, we won the Quality Award. After our first win of the season, we are excited to next participate in the Sacramento Regional, taking place on March 24 at the ARC Pavilion at UC Davis.



### BUILD SEASON HAS ENDED

Six weeks of hard work have finally paid off, and we now have one able-bodied robot to play in the 2018 Power Up season, and two more to improve and practice with. Each week was documented by the Business and Media subteam. The continuous build blog can be found on our website with the password, 2k16!HoppeR. Our team spent the last few hours of Stop Build Day (February 24) doing what they could to prepare to bag the robot. At exactly 9 pm, we "bagged and tagged" our robot by packing the robot into a large bag and sealing it shut. The robot was placed into our trailer, ready for competition in Utah. Although our competition robot is complete, the team continues to test new mechanisms and strategies with the beta and alpha robots.



### SPONSOR OPEN HOUSE

Our Sponsor Open House, held on February 24, was a success! During our third annual Sponsor Open House, we invited all of our local sponsors to come take a look at the work that we do. Along with breakfast, the sponsors were given a tour around the shop by students, and then witnessed a demonstration of one of our 2018 robots. Students provided explanations of our subteams, outreach, and the opportunities that they receive on the team. Representatives came from UC Davis, Hill Engineering, WestCoast Products, and TechnipFMC.

### TEAM INVITED TO STEAM CONFERENCE

Tom Adams, the president of the DJUSD Board of Education, formally invited a group of students from Citrus Circuits to represent Davis at the 2018 STEAM Symposium. The symposium event will take place in Long Beach on October 28-29. In addition to Science, Technology, Engineering and Mathematics, Art is included because it "recognizes the importance of braiding together Science, Technology, Engineering, Art, and Math learning like the strands of a rope." During the conference there will be over 3,000 teachers, as well as more than 300 presenters, leaders, and educators talking about the importance of STEAM and leadership.

### INTRODUCING OUR 3D PRINTERS

3D printing is the latest industry-standard tool our team is using as a part of our design and fabrication process. It allows us to quickly and accurately produce durable, complex parts that are specifically designed to meet the requirements of our robot design. To create an object with a 3D printer, the object must be designed in CAD and uploaded to the printer through WiFi. Once this is done, the object is printed from bottom to top using slices of plastic. Our team currently uses 3D printers to make mounting mechanisms for the robot. The process can take from 10 minutes to a few hours depending on the size and complexity of the object. On the 2018 robot, the pulleys on the powered mechanisms, elevator supports, and the fabrication on our ramp latch are all made from a 3D printer.

With our new printer from Markforged, using computers and 3D printers to design and fabricate the parts is easier than ever. Last year, the mechanical subteam ordered their first Markforged at the end of the school year and found that it was easy to use and printed at a very fast pace. Our last printer used Onyx, a very strong and heat resistant plastic, but had limited durability. We are grateful to Markforged for sponsoring us with a discount on our new 3D printer, the Mark Two. The printer is extremely useful, as it allows us to use Carbon Fiber to strengthen the Onyx plastic and create a far more durable mechanism. It was clearly a good investment, as we have used it consistently since purchasing it.

### READY TO COMPETE FOR THE CHAIRMAN'S AWARD

After six months of hard work, the Chairman's subteam submitted the completed Chairman's Essay and is ready to compete for the Chairman's Award. The essay is based on our team's three foundational pillars (Outreach, Education, and Commitment to Excellence.) The Education section discussed our robotics classes, Peer-to-Peer program, Citrus Circuits alumni's current activities, and our sponsors' role in local STEM programs like TechTrek. Under Outreach, they wrote about our Davis Youth Robotics league teams, summer camps, career skills workshops, and our winter shelter app. This year, the chairman's subteam changed the name of the third foundational pillar from competitive success to "commitment to excellence." In Commitment to Excellence, the subteam highlighted how we have helped other teams become successful. Some of the ways we mentioned are our Fall Workshops, Citrus Service, founding three local teams and the compass alliance.



Our chairman's presentation team: Katie Stachowicz, Anoushka Chander, James Zablosky

### ALUMNUS DAVID RAPPAPORT

On February 17, David Rappaport, one of our favorite alumni and a past mentor of team 2036, visited the shop. David was on our team from 2010 to 2011, and joined because of encouraging words from his friends on the team. During his time on the team, he helped to program the robot, including a successful autonomous program, which led to the first ever victory for 1678 at the Sacramento Regional in 2011.

While David attended the University of Colorado and majored in Electrical and Computer Engineering, he also mentored Team 2036 Fairview Robotics, and helped grow their student and mentor support. Currently, he is studying at the University of Washington for a Masters in Human-Centered Design and Engineering.



David has also been interning at Microsoft, and was excited about the ways that tangible innovations could bring people together. With this in mind, he brought together a group of people to work on hardware, predict new technical necessities, and develop new tech. He said that the things he works on now leverage his FIRST skills perfectly. "For me, being on 1678 cemented the fact that you can accomplish a lot of concrete work in a short amount of time, with little resources or instructions, and with a small team," he explained. "From FRC, I developed a sense of 'just go for it, just build it and test it and see what works' that is really useful for getting things done efficiently."

David stressed his work was confidential, but was able to say that he worked on innovations at the forefront of human-computer cooperation, answering the question of how interaction technology can better serve humanity. He has also used low-cost, low-power computers to make facial recognition software for the blind. After being asked what differences he saw between the bustling Saturday shop and the team he was a student on seven years ago, he said the 2011 team was "much scrappier. We worked out of a large shipping crate and had to pull out folding chairs just to have an indoor workspace. We had about 15 dedicated members, whereas now you've got about 100." Despite that, he emphasized that the explosive success of our team from a little corner of DaVinci High School is what makes us so special and inspiring to the FRC community.