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SCHOOL SCENE in Almaden Valley

## Back in the game

*Thanks to NASA, Leland robotics lives again*

By Kymberli W. Brady  
*Staff Writer*

Determined to resurrect a cash-strapped program, Leland students are busy conducting final tests on Quicksilver 406 before heading to Portland's "Triple Play" robotics competition.

The ambitious undertaking couldn't have happened without the help of teacher Helen Arrington or parents Jim Mori, along with Deborah and Gustavo Arambula, none of whom are strangers to robotics. However, it was a \$6,000 grant from NASA that rocketed the project into gear and landed team Quicksilver a spot in the FIRST robotics competition March 9-12.

The determination stems from a desire to continue with the First Lego League [FLL] robotics program that many students left behind in elementary and middle school, including team leaders Amy Qian and Gabriel Arambula, along with Mori's daughter Jennifer, who led her Castillero team, The Super Nova Girls to nationals.



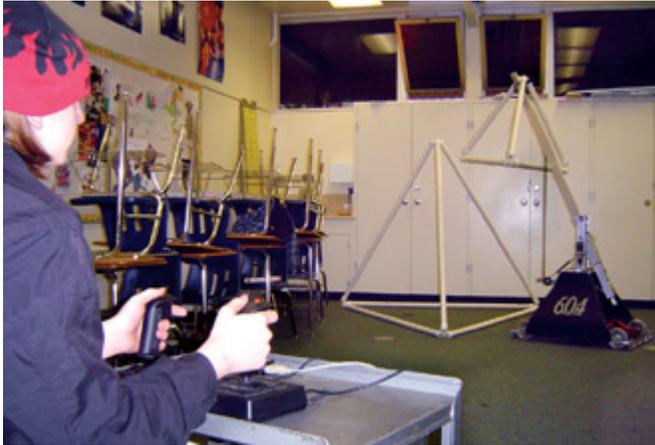
*Team Quicksilver irons out the last of the technical and mechanical kinks as they prepare for the robotics competition in Portland, Ore., next month. From left, Jennifer Mori, Gustav Arambula, and Gabriel Arambula, along with Jim Mori, Peter Lu, and Alejandro Arambula (at the robot), Amy Qian, and Michael Bella.*

"Last year, we didn't have any money for a robotics team," explains Jennifer, "We applied for a Lego's grant, but didn't get that. Then we got the NASA grant and now we're going to Oregon to compete."

Once funded by the school district, Leland's floundering robotics program fell victim to budget cuts last year. But that didn't stop Arrington [at the gentle nudging of former principal Susan Votaw] to look for funding elsewhere.

"She said, 'do I have something for you—just a few-page application,'" exclaims Arrington. "It ended up being a 14-page application that I needed to fill out for a NASA grant! Well, we got the grant and Mr. Mori has been our angel. He wanted robotics to be here and made it happen too."

“We got it because the grant wasn’t taken,” said Mori. “The stipulation was that we had to go to Portland. “If we come up with more money, then we can use the robot and compete in local tournaments, but we still need to come up with the entry fees. If we do well, then we might be able to go to nationals, which of course, costs more money.”



*Michael Bella demonstrates the robot’s ability to perform the challenge they will be faced with in the Portland competition.*

The \$6,000 NASA grant will cover entry fees and enough parts to construct a standard robot for the Portland competition. Airfare and hotel however, will be extra, along with entry fees and expenses for future contests. With a typical entry fee of \$4,000, the nearly insurmountable goal hasn’t curbed their enthusiasm.

### **Raising the bar**

But this is the big league, and along with the higher entry fees comes bigger challenges and even bigger robots—a task that requires the design and construction of a 28 by 38 inch robot that must weigh less than 120 pounds and be no more than 5 feet tall at the start of the competition. To keep

it equitable, each team is allowed to spend a maximum of \$400 on any one part and \$2,000 on the entire robot.

However, there are no limits placed on the amount of time and materials obtained from outside contributions, resulting in the dramatic and elaborate entries that keep the competition on the cutting edge.

The theme, “Triple Play,” calls for each team to command their robot to move tetrahedron triangles [tetras] around on a playing field. One of the tasks will include stacking 3-foot tetras on top of larger, 5-foot counterparts.

The challenge will lie in trying to score the most three-in-a-row or tic-tac-toe –like formations in nine different positions for extra points.

Mori, a well-known and respected leader in local robotics circles, is now using his machine shop skills to help them step up to the new super-sized challenge.

“This is kind of the next step in robotics,” he admits.

“But it’s a lot of work. Basically, I told them they had a store-bought robot. But they didn’t want that, so I said, ‘start designing something.’ Now we’re spending every weekend on it. They come up with the sketches and I cut the parts for them. My company, Exatron, has been very supportive in allowing me to have free access to the machine shop for these kids. It’s really cool.”

“The kit,” according to Alejandro Arambula, “comes with a basic chassis, a two-wheel drive motor, diagrams and parts that give you a good chance to compete with other teams. With Legos, you have the pre-fabricated snap-on pieces. But with this, you either use theirs or you make your own, which we did.”

### **Thrifty and resourceful**

“One thing I love about these children, they know we don’t have much money, so they savage around and find parts to use on the new robot. They’re so thrifty—I love it. These kids get so much out of this and I see so much growth—that in itself is worth doing this,”

Arrington notes, as she points to a former robot skeleton in the corner of the room.

In just five weeks, the Quicksilver 604 has been modified into an aluminum chassis with four-wheel drive for better traction and maneuverability, and features a pivoting, telescoping arm that is kept tightly in gear via a bicycle chain and rear derailleur.



*Amy Qian and Michael Bella prepare holding brackets for their custom four-wheel drive motor, while Jonathan Boyd, Peter Lu, Alejandro Arambula, and Jennifer Tsau add decorative touches to the robot’s retractable arm apparatus.*



*If it doesn't exist or she simply can't find the tool she needs, team leader Amy Qian is quick to make her own.*

will be a big boost to the school and there. We just have to find them.”

“Everything has been machined and remanufactured,” explains Alejandro’s father Gustavo. “The chassis, chains, pistons, and wheels have all been fabricated from scratch. It’s completely different and a lot of it was just brainstorming. It’s been a lot of work in a very short period of time. And there were always problems that needed to be solved, but fortunately, we’ve got some really sharp people here.”

“Now it’s crunch time,” notes Amy. “It’s every day after school, every day at lunch, and on weekends. You can kiss your social life goodbye. It’s totally worth it though. You have so much fun.”

### **Dream big and plan ahead**

In addition, the group has an aggressive three-year strategy in the works, which includes fund-raising, recruiting, and an extensive Web site presence, as well as the recycling and reconstruction of the robot to meet the changing objectives.

“This is the just the beginning,” explains Gustavo. “This is a really good rookie team and next year, it’s going to get even better. We want to build a full robotics organization, with department heads and officers. If we do good in Portland, it

generate more interest with the kids. We know they’re out

*FIRST [For Inspiration and Recognition of Science and Technology] Robotics focuses on expanding the creative, tech-savvy minds of students while challenging them to perform specific tasks and compete with others in the spirit of fair play. For more information, visit [www.usfirst.org](http://www.usfirst.org).*

*Students interested in the robotics program are encouraged to contact Ms. Arrington in Room E-1.*

*Anyone interested in keeping Leland’s Robotics Program alive through financial or material contributions can call (408) 535-6290 and ask for Mrs. Arrington.*