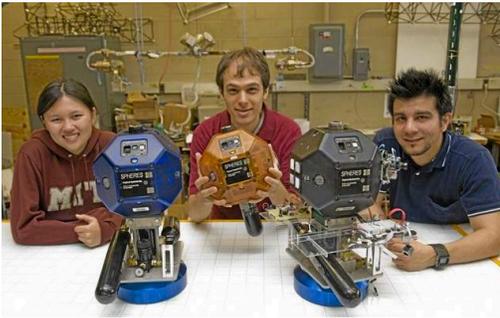


# DAILY BREEZE

## El Segundo High School competes in coding competition for International Space Station

January 15, 2015

By: Jordan England-Nelson



The challenge put before five engineering students at El Segundo High School seemed daunting: Program a miniature satellite to orbit a spinning asteroid inside the International Space Station.

The students have been coding since October and, on Friday, as finalists, their program will be put to the test in an international competition organized by NASA and the Massachusetts Institute of Technology.

Fourteen international teams that designed code that will be loaded onto robotic spheres that look like angular soccer balls.

The spheres are equipped with carbon dioxide thrusters and a camera. If the students have written their code correctly, their sphere will circle an imaginary asteroid and snap photos from different angles.

“The most challenging part about this project was debugging the code when it did not work,” Victoria Chu, the El Segundo team captain, said in an email. “Sometimes it was something really small that kept our code from compiling. Having a team really helped to catch careless mistakes.”

The competition is more than just a way to get kids excited about science and engineering, according to Ron Chu, an electrical engineer and mentor for the team, known as the Space Eagles.

“Basically, it’s like NASA’s way of crowd-sourcing and getting students to help them come up with solutions for their missions,” he said.

This year’s challenge was inspired by the European Space Agency, [which landed a probe on a comet in November](#).

The challenge last year was to deflect a giant (imaginary) asteroid that was hurtling toward Earth. El Segundo made it to the finals of last year’s competition as well.

El Segundo student Jakub Koziol said in an email that competing in a real world situation, rather than reading out of a text book, helped with the learning process.

“You have a different mind set,” Koziol said. “In a textbook you learn just to retain the information, but in the competition you try to win and by trying to win you learn.”

The competition, which is scheduled to begin early Friday morning, includes teams from across the United States, Europe, Mexico and Russia. The El Segundo team collaborated with students from Maryland and Italy.

The teams used the coding language C++ to control the robotic spheres. All the directions needed to be programmed in advance, meaning once the test begins the students cannot do anything to change the sphere’s actions.

Points are awarded for how close the sphere gets to the asteroid (which only exists inside the code) and how many different angles are captured.

The students also had to worry about virtual solar flares, which were emitted from a virtual sun every 60 seconds. Part of the challenge was to code the movement of the sphere in such a way that the sphere would always be in the shadow of the asteroid whenever the flares occurred to protect the sphere’s instruments from getting damaged by the flares.

Points are deducted for being exposed to flares, using too much fuel or bumping into the asteroid.

A few weeks after the competition ends, a computer generated video will be produced that will include an animated asteroid and as well as the trajectory of the sphere.

Victoria Chu said she enjoyed using her computing skills in a real world situation. But she's still on the fence about a career in space.

"Aerospace engineering sounds like an interesting field of study and is definitely an option I am willing to explore in college," she said.

<http://www.dailybreeze.com/technology/20150115/el-segundo-high-school-competes-in-coding-competition-for-international-space-station>