

Ventura County Star

Students in Thousand Oaks learn about combining nature and technology

By Rachel McGrath

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The marriage of nature and technology, to create robotic tools to help humans, came alive for a group of home-schooled students in Thousand Oaks during a live video chat with a leading researcher in the field who works in Germany.

Fifteen youngsters who are enrolled in the “Biomimicry With Physics” class taught by Laura Erlig of the One Spark Academy connected with Steve Rommel of Germany’s Fraunhofer Institute via Skype during their class time Thursday at the Thousand Oaks Teen Center.



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CARLOS CHAVES/SPECIAL TO THE STAR Amara Baker tests the hydraulic lift she built during One Spark Academy’s “Biomimicry With Physics” class at the Thousand Oaks Teen Center.

Rommel spoke about how researchers there have developed a robotic spider that mimics the way a spider moves and is produced using 3D printing and modular assembly. “Spiders are very agile. They can move almost all places, and basically the legs of spiders work similarly to hydraulic systems,” Rommel said.



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CARLOS CHAVEZ/SPECIAL TO THE STAR Amara Baker (left) and Jasmine Wright are assisted by Steve Rodgers as they build a hydraulic lift during One Spark Academy’s “Biomimicry With Physics” class.

The robotic spider’s movement is facilitated by the institute’s patent-pending “living hinges” technology, which basically uses compressed air to operate hydraulic bellows.

The hydraulic bellows make the robot’s legs move and, as a real spider does, it walks keeping four of its eight legs on the ground at all times to maintain its stability.

Rommel told the students the prototype could be developed to serve as an exploratory tool. He said one possibility might be to use robotic spiders to inspect the dykes that protect the

Netherlands, a country with areas below sea level.

Another option would be to use them in the event of a natural disaster or a hazardous incident such as the Fukushima nuclear plant incident in Japan. The robots could be sent in instead of people to send back video and measure radiation leaks.

“It’s just so cool that with the technology we have today, we can track the way that animals move and put it into our technology and use it for our life to help us be able to do things easier,” said Audrey Shepard, 13.

“I’m fascinated by it,” said Annalise Robbins, 17. “How cool is that, taking stuff from nature and improving the things we have today.

“To be able to talk to other people around the world is so connecting. I feel like the world isn’t so big.”



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CARLOS CHAVEZ/SPECIAL TO THE STAR Students of the One Spark Academy’s “Biomimicry With Physics” class in Thousand Oaks speak to Steve Rommel of the Fraunhofer Institute for Manufacturing Engineering and Automation in Germany via computer.



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CARLOS CHAVEZ/SPECIAL TO THE STAR One Spark Academy’s “Biomimicry with Physics” instructor Laura Erlig (right) directs students to the next session of the class at the Thousand Oaks Teen Center.

Erlig said biomimicry encourages youngsters to look at the role of nature and sustainability in science and concepts based on that. She said being able to connect directly with experts via Skype and ask questions and get answers directly from them is a valuable learning experience for her students.

“I feel it inspires them to see and hear engineers from different places and encourages them to go into this type of field,” Erlig said.

Before the link-up with Rommel, the students had engaged in a hands-on experiment to learn about hydraulics with Steve Rodgers, a robotic service engineer at Agilent Technologies.

“What we’re trying to show is that a small amount of pressure on a hydraulic surface can lift some pretty good weight,” Rodgers said. Using kits supplied by Agilent, the students each built a small hydraulic lift using syringes filled with water to raise a platform.

“There’s some water in this tube and we connected it to another one and as you

push the water into the other one it picks up this lift,” said Amara Baker, 12.

Sky Petrula, 12, said she was surprised at how easy it was to lift a kilogram weight using just a little water.

“It’s heavy when you lift it up yourself but with this, it’s not hard at all,” she said.
“This is really fun.”