



OREGON EPISCOPAL SCHOOL

SCIENCE RESEARCH SUCCESS CONTINUES RICH TRADITION AT OES

TEAM WINS SIEMENS COMPETITION WITH EMOTION RECOGNITION SOFTWARE

The research-based science program at Oregon Episcopal School allows students to pursue their interests deeply. Their passion and hard work, along with mentoring by their teachers, frequently lead to success in national and international science competitions. That was the case when juniors Akash Krishnan and Matthew Fernandez won the team category in the national finals of the 2010 Siemens Competition in Math, Science and Technology.

Matt and Akash, students at OES since Kindergarten and First Grade respectively, were inspired by *I, Robot*, a movie in which a robot can sense when its user is under stress. Using an emotional speech database with 18,215 files, they achieved a 60 percent accuracy rate in identifying emotions, a notable improvement over the 41 percent accuracy of other researchers' attempts. They hope to use their research to develop a watch-type device to help autistic children recognize the emotions of other speakers.



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Their project, titled “The Recognition of Emotion in Human Speech,” earned them a \$100,000 prize from Siemens, which hosts the annual competition to identify talented students and foster their research abilities. Akash and Matt join many OES students from the past who have been recognized by Siemens and by the Intel Science Talent Search.

PROJECT TAKES STUDENT TO INTEL FINALS AND MEETING WITH PRESIDENT



From left are Intel CEO Paul Otellini, OES student Laurie Rumker, Yushi Wang from Sunset High School, and President Barack Obama. Photo courtesy of the White House.

Laurie Rumker was one of 40 national finalists in the 2011 Intel Science Talent Search competition. She investigated the long-term stability of organic structures in a pollutant containment system used in Portland’s Willamette River and the susceptibility of the containment system to experience biodegradation from naturally occurring local bacteria. While she found that the organic structures were not likely to be susceptible to biodegradation in the short-term, her work raised interesting questions about the changes the containment material could undergo in the long-term. Her research contributes to knowledge about restoring the environment, which is consistent with the OES mission—helping students realize their power for good. Laurie also received a scholarship from the Davidson Institute for Talent Development for her work and was invited by the Davidson Institute to discuss her research with President Obama.

RECENT OES NATIONAL SCIENCE COMPETITION SUCCESS

Students who reach the highest levels of science competition put in an extraordinary amount of work on their own time to achieve their results. However, every OES student learns through hands-on experimentation in class and starting in the sixth grade, does a science research project each year. Whether or not students choose to compete in science competitions or to pursue a career in science, all students gain experience with guided inquiry, critical thinking, group process, structured problem solving, and presentation skills.

SIEMENS COMPETITION IN MATH, SCIENCE AND TECHNOLOGY

The Siemens Competition in Math, Science and Technology recognizes remarkable talent early on, fostering individual growth for high school students who are willing to challenge themselves through science research. Through this competition, students have an opportunity to achieve national recognition for science research projects that they complete in high school. Siemens awards \$100,000 in prizes to the top individual and the top team in its annual competition. In 2010, OES students Akash Krishnan and Matt Fernandez won the award for best team and shared the \$100,000 prize. Below are the names of OES students who have been finalists or semifinalists in the competition in the past 10 years.

SIEMENS NATIONAL FINALISTS

Team of Akash Krishnan '12 and Matthew Fernandez '12 (1st Place)
Team of Ashley Morganstern '03 and Leslie Taylor '03
Team of Gabriel Rosenhouse '02 and Mark Saiget '02

SIEMENS REGIONAL FINALISTS

Sergio-Francis Zenisek '06
Michael Coulter '04
Team of Chandler Hatton '02 and Jordan Wirfs-Brock '02

SIEMENS NATIONAL SEMIFINALISTS

Team of Kerry Streiff '10 and Dennis Shi '10
Scott Harpool '09
Patrick Chen '08
Team of Rahael Gupta '08, Julia Cohen '08, and Lia Dawley '08
Myles Schmerztler '08
Katie Snyder VanderWeele '08
Team of Keenan Ferar '07, Arnaud Sillis '07, and Brian Siperstein '07
Team of Lynne Adams '05, Sarah Hayes '05, Nick Thiessen '05, and Christina Walitzki '05
Team of Henry Hirsch '03 and Karl Kuchs '03
Michael Li '03
Katherine Murphy '03
Andrew Platt '03
Mariam Totonchy '03

INTEL SCIENCE TALENT SEARCH

The Intel Science Talent Search (Intel STS) is the nation's most prestigious pre-college science competition. Alumni of STS have made extraordinary contributions to science and hold more than 100 of the world's most coveted science and math honors, including seven Nobel Prizes and four National Medals of Science. The Intel STS recognizes 300 students and their schools as semifinalists each year—pulling from 1,744 applicants in 2011—to compete for \$1.25 million in awards. From that select pool, 40 finalists are then invited to Washington, DC, to participate in final judging, display their work to the public, meet with renown scientists, and compete for the top award of \$100,000. In 2003 and 2004, OES students placed in the top three. Below are the names of OES students who have been finalists or semifinalists in the competition in the past 20 years.

INTEL NATIONAL FINALISTS

Laurie Rumker '11
Michael Loy '09
Sergio-Francis Zenisek '06
Elyse Hope '06
Ryna Karnik '04 (3rd Place)
Michael Li '03 (2nd Place)
Melissa Ann Radecki '01
Patricia Jeanne Semura '99
Courtney Voelker '95

INTEL NATIONAL SEMIFINALISTS

Achala Chittor '11
Joshua Steinberg '10
Katie Snyder VanderWeele '08
Allison Rhines '06
Neil Lakin '05
Yvonne Yamanaka '04
Mariam Totonchy '03
Thuy Le '02
Jennifer Louise Percy '01
Jessica Anne Yu '98



Semifinalists in the 2006 Intel Science Talent Search included, from left, OES students Elyse Hope, Allison Rhines, and Sergio-Francis Zenisek.

PROJECT HIGHLIGHTS

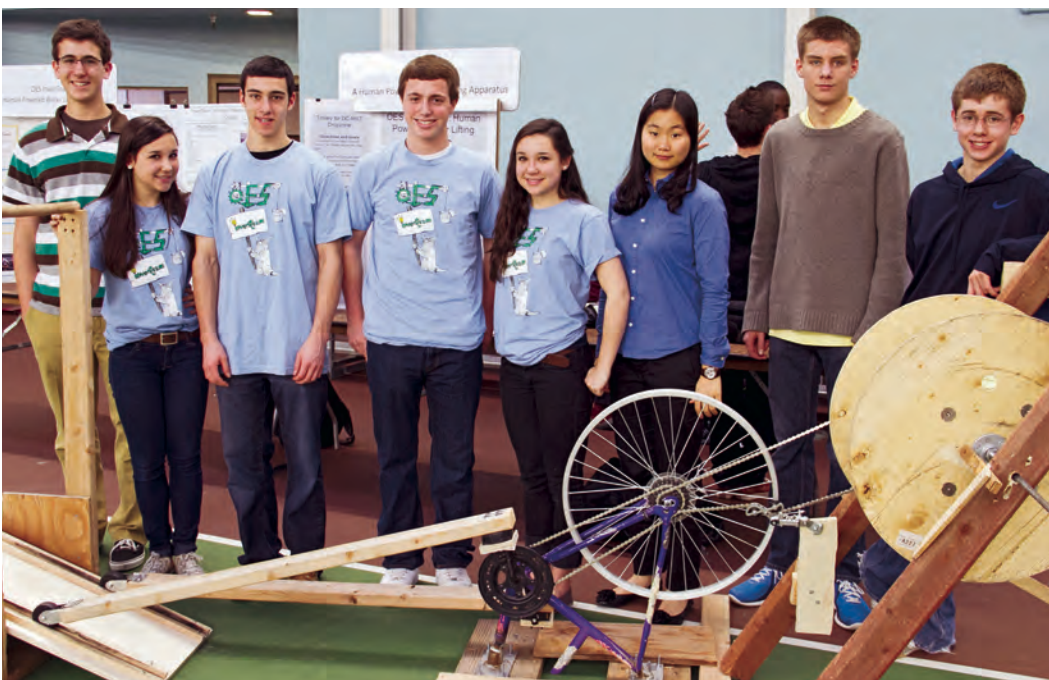
GO-YAK

Students in the engineering design class at OES wanted to create a vehicle that could explore the 59-acre OES campus, including the two wetlands. They designed and built a vehicle that can go from zoom to splash instantly. It was not clear whether it was an amphibious go-kart or a terrestrial kayak, so they named it a "go-yak." The project required the students to work together, to understand engineering principles, and, most of all, to improvise.



SOLAR POWER CHARGES STUDENT LAPTOPS

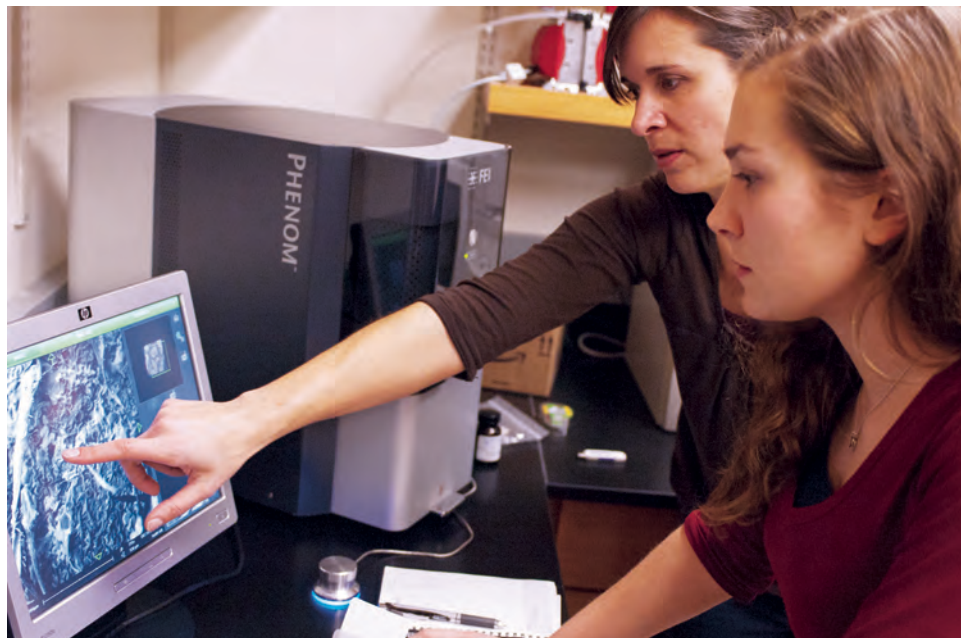
Two Middle School students set up a solar panel on the roof of the OES Drinkward Center for Math, Science and Technology. They obtained the panel by soliciting a local solar company for a donation, mounted the panel on the roof, and installed other components such as the charge controller and inverter. The students—Josh Clark and Marie Fernandez—worked with solar installation companies and electrical specialists who did the wiring for them. In addition to recharging laptops, the system provides a "green" charging station lab that other students can use to run experiments on solar energy.



INVENTEAM

A group of OES students called the InvenTeam is working on a project that they hope will transform the lives of poor farmers in arid nations. The goal is to create a human-powered pump that will increase the efficiency of irrigation so the farmers can increase their income, improve their nutrition, and send their children to school. The students created a prototype that they took to a conference at the Massachusetts Institute of Technology, where they discussed it with professional inventors and brought back refinements to incorporate into a second prototype. That prototype was installed in a village in Liberia, and the students continue to work on refinements to make the pump more efficient and less expensive.

SCIENCE AT OREGON EPISCOPAL SCHOOL



The School's Independent Study program is an option for students who are able and interested in working on their own in-depth investigation. Students may work with mentors and researchers at Oregon Health Sciences University, Portland State University, and other institutions that are doing cutting-edge research. Now, with the new Platt Global Classroom, teams of students can videoconference with a scientist or researcher anywhere in the world.

FACULTY MENTORS

More than half of the OES Upper School science faculty hold PhDs. They are committed to teaching the process of science as a tool for critical

The OES Science Department recognizes the need for a basic but thorough science education for everyone in our increasingly technological world. Three years of high school science are seen as desirable at OES and are required for acceptance by many colleges and universities. Our program offers a strong, basic science education in state-of-the-art laboratories. Physics is the first course followed by chemistry and then biology. Our sequence acknowledges the actual structures of the science disciplines in which knowledge of physics concepts is useful for learning such chemistry ideas as the mechanisms of chemical reactions. A knowledge of chemical concepts is useful for learning topics in molecular biology and biochemistry.

Independent research, group process, critical thinking, structured problem solving, and clear communication are honed in all science course offerings. A breadth of science elective course offerings allows students to explore subject areas beyond the three-year sequence.

HONORS AND INDEPENDENT STUDY

The Upper School offers honors courses that require a more rigorous math background for deeper study at an accelerated pace. The honors courses provide opportunities for acceleration and enrichment to talented and motivated students who are very interested in science and who aspire to careers in science, engineering, or medicine.

thinking by insisting that students support a conclusion with scientific data. In addition to classroom teaching, they mentor students by discussing their research with them, making suggestions, and helping students make connections with professional scientists doing similar research. Oregon Episcopal School provides a supportive, challenging, exciting, caring, and well-rounded experience. The OES community takes great pride in its long tradition of providing an excellent education for our students.

SCIENCE COURSES FOR GRADES 9 – 12

Physics
Honors Physics
Chemistry
Honors Chemistry
Biology
Honors Biology

RECENT SCIENCE ELECTIVES AND ACTIVITIES

Anatomy & Physiology
Astronomy
Chemical Synthesis
Cognitive Psychology
Electronics
Engineering Design
Environmental Geology
Greenhouse
InvenTeam
Marine Ecology
Microbiology
Natural History
Robotics



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